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THE IRON TRADE REVIEW

VOLUME XXXI. CLEVELAND, O. DECEMBER 15, 1898. CHICAGO, ILL. NUMBER 50

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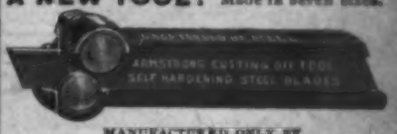
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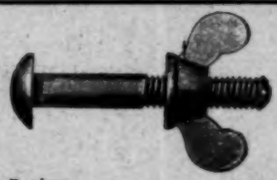

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THE IRON TRADE REVIEW

VOLUME XXXI. CLEVELAND, O. DECEMBER 15, 1898. CHICAGO, ILL. NUMBER 50

THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The advance in Bessemer iron and the strong buying movement noted last week found a prompt response in the market for foundry iron. Buyers in all parts of the country have been negotiating in the past week with the result that well above 150,000 tons of foundry and forge irons have been bought in four or five important markets and a large tonnage is still under inquiry. More significant than this movement, as an index of a condition that may confront the trade in the early months of the new year, is the fact that Southern furnaces have refused some of the business offered because of the impossibility of insuring the deliveires required. The consuming trade has been loath to believe that with the enormous production of iron such a condition could come about; it has been skeptical, moreover, of the intimations that higher prices might come, if the conditions noted in the past three months should continue. The number of contracts for foundry iron closed the past week and the number of buyers now in the market indicates a simultaneous appreciation of the drift and a desire to provide against what seems to be just ahead. The advance of 25 cents by Southern producers one week ago brings No. 2 up to $8 at Birmingham, and Northern irons have advanced from 15 to 25 cents under the buying movement of the week. Foundrymen who usually contract after Jan. 1 have been in the market and some who usually buy but a six months' supply have sought to close for a year. In view of probably higher ore and coke, furnaces have asked more money on these long contracts and some of them are chary of taking chances beyond the middle of the year. The advance over the contracts of a year ago is moderate, as yet—about 50 cents with Northern furnaces, and this in the face of conditions greatly changed from those of 12 months ago. The Bessemer furnacemen of the two valleys seem content to let demand fix the price of iron, now. Some business has been done at $10.75 Pittsburg, and $10.25 in the valley has been quoted for first quarter, with $10.50 talked of for the first half. Billets are firm at $16 Pittsburg for the first quarter, and large sales have been made in the past 10 days. The railroads have so filled up rail mills, plate mills and bar mills with the orders lately placed, and given such a stimulus to business in a score of other lines, that the status of finished material markets for the first half of 1899 is already well fixed. The surprise still is that rolled products have made practically no response to the strong situation in pig iron and steel. The export demand may account in part for this conservatism, for steel works seem determined to hold this business at all hazards. The rail business of the past week was about 150,000 tons in Central and Western territory. In some cases Eastern mills not in the arrangement between makers west of the Alleghenies have been quoting competitive prices. Car and locomotive orders are being distributed with a liberal hand and there is no indication of a let-up. In the Chicago district all classes of finished matrial have been represented in liberal sales, much of the business being traceable to the railroads. Sheet manufacturers have been in session in Pittsburg this week and a committee has been appointed to draft a schedule of advances for black and galvanized sheets; but, as heretofore, such advances will only hold if the demand is sufficient to hold up the market.

PITTSBURG.

OFFICE OF *The Iron Trade Review and Industrial World.*
705 PUBLICATION BUILDING, Dec. 14.

The course of the pig iron and billet markets in the first half of this month has not been paralleled by any similar period in the past. The Bessemer iron market has developed further strength since the heavy sales recorded last week, while in soft steel billets the mills, already with considerable 1899 tonnage booked, have had a strong buying movement which has put steel fully $1 a ton above the prices of a month or six weeks ago. There is a continuance of the export movement, which may, however, be checked by the advances just made. In more finished lines the activity is all that could be expected for December.

PIG IRON.—Some further, though small, sales of valley iron have followed the large lots recorded in last report, and these have gradually advanced the price for valley iron until now nothing below $10.25 can be done, and the furnaces claim to be in such position that they cannot book much more tonnage even at this figure. There have been some moderate sales of Pittsburg iron at about $10.75, which represents the market to-day, and establishes the relation between valley and Pittsburg iron, the customary freight being now 50 cents, although 65 cents is still scheduled. In forge and foundry iron there has been enough business to maintain prices fairly well. We quote:

Bessemer, valley furnace	$10.25
Bessemer, Pittsburg	10.75
No. 1 Foundry	10.75 to $10.80
No. 2 Foundry	10.10 to 10.25
No. 3 Foundry	9.65 to 9.85
Gray Forge, valley furnace	8.90 to 9.00
Gray Forge, Pittsburg	9.40 to 9.50

BILLETS AND RODS.—Following the diversion of a very important billet capacity to rails for the balance of this year and the first half of next, there has been a heavy inquiry for billets, which resulted in sales last week up to $15.75, Pittsburg, and a continuance of the conditions brought the market up to $16, Pittsburg, this week. A number of the steel mills are reported fully sold up for the first quarter of next year, while of the remainder probably two-thirds of the capacity is already contracted for, with important interests yet to purchase. In view of this fact, it is not probable that under $16 can be done for the first quarter of next year, and higher quotations for the second quarter, and even for the first quarter, are freely made. There is even talk of a scarcity, but this is not to be taken too seriously under present conditions. Wheeling and valley interests have sold to Pittsburg consumers in good quantities. In sheet bars there is no market at all, as sheet mills have fully covered, and there is no buying for tin plate manufacture because the original owners of the plants have closed them and the new owner has not yet come into the market. Wire rods have firmed up materially, and are now quoted at $21.

PLATES.—The report that the much talked of Coolgardie

order has been finally placed with a leading Pittsburg mill cannot be confirmed, though it seems assured that it will come to Pittsburg. The market is steady at unchanged prices. We quote: Tank, 1.15c; shell steel, 1.20c; flange, 1.25c; firebox, 2c and upwards.

SHEETS.—A fair tonnage has been booked and some few of the mills have advanced their quotations to 1.90c and 1.92½c for No. 28 common, but lower than this can still be done, and for desirable lots as low as 1.85c could be secured. The manufacturers held a meeting here Tuesday, at which nothing of importance was done. In galvanized iron there has been a moderate activity, but 80 and 7½ per cent off list, with a 15-cent freight allowance, can still be done.

FERRO-MANGANESE AND SPIEGEL.—These lines are unchanged and former prices are quoted; ferro-manganese at $50 for 80 per cent domestic, and spiegel at $23.50 and $24, though the lower price may be shaded in some quarters.

SPELTER.—The spelter market has eased off and is irregular. New York is quoted at from 5.25c to 5.30c, and St. Louis at 5.07½c to 5.10c.

RAILS AND TRACK MATERIAL.—Further sales are reported, including some tonnage in the Central West. The price for standard rails seems to be from $17 to $18, while as high as $19 is being quoted for small orders of light section. Competition between Eastern and Central mills determines the price on business for which the former can compete. The demand for track material has increased materially in some lines since the snow began, the roads requiring an extra supply of such articles as links and pins on account of the large numbers that are lost under the snow during the winter. Quotations are unchanged as follows: Spikes, 1.45c; track bolts, 1.65c to 1.70c; splice bars, 1.10c to 1.15c; links and pins are quoted from 1.20c to 1.27½c.

IRON AND STEEL SKELP.—There is no material change in the market as regards demand or prices, and we continue to quote: Grooved iron skelp, 1.05c to 1.07½c; sheared iron skelp, 1.17½c to 1.20c; grooved steel skelp, .97½c to 1.05c; sheared steel skelp, 1.10c to 1.12½c.

PIPES AND TUBES.—The pipe mills continue well occupied, mainly on old orders, with the usual run of current business in small lots. Prices are maintained at about the former level, and we continue to quote additional discounts of six tens for less than carload lots, and six tens and five for carloads. Base discounts are: Butt weld, black, 55 per cent off; lap weld, black, 65 per cent off; butt weld, galvanized, 47½ per cent off; lap weld, galvanized, 52½ per cent off. Discounts on merchant boiler tubes are as follows: 2¼-inch and smaller, 72½ per cent off; 2½ inch and larger, 75 per cent off. Inserted joint casing is quoted at 60 off and screw and socket joint casing at 60 and 10 per cent off.

STRUCTURAL MATERIAL.—This market is firm and production is large considering the time of year. No large contracts have been made lately. We continue to quote the list as follows: Beams and channels, 3 to 15 inches, 1.20c; 18 to 24 inches, 1.30c; tees, 1.25c; zees, 1.20c, and angles, 1.10c. Universal plates are generally quoted at 1.10c but some firms are holding for 1.15c and are getting business.

OLD MATERIAL.—The sales have been of moderate volume for the season, and the list of prices remains about as last given. We quote: Old steel rails, long lengths, $9.75; cut, $10 to $10.25; old iron rails, $13.75; wrought iron scrap, $11.50, net valley; cast borings, $6; busheling scrap, $9, net; car wheels, $10.25, gross; cast scrap, $9, gross; iron axles, $6, net; steel axles, $12.50, gross; charcoal scrap, $10, gross; wrought turnings, $6.75, net, valley.

CHICAGO.

OFFICE OF *The Iron Trade Review and Industrial World.*
1522 MONADNOCK BLOCK, Dec. 14.

Nearly every branch of the trade was active last week, and the demand for every kind of material indicates a good business for some time ahead. Prophecies of a shortage in iron and steel, particularly in pig iron of foundry grades, are becoming more frequent all the time. Many dealers and buyers who have been bears on the market for a long time past have changed to bulls in the past few weeks, and now are enthusiastic believers in a larger use of iron and steel, and higher prices. Statistically, the market was never stronger than at present. With the furnaces and most of the mills sold well into the future, and a large demand still unsatisfied, with stocks lower than for years before, there seems to be good reason to look for higher values within a short time. It is freely predicted that 1899 will show a much larger consumption of all kinds of iron and steel than any previous year, and at prices above those prevailing at present. Buyers have come into the market freely in the past week, and purchases of material have been large. Fully 50,000 tons of foundry irons were sold in the week ending last Saturday, and the number of buyers was surprising. The tonnage of rails was good in the week; heavy sales of billets were made, and orders for plates were excellent.

PIG IRON.—The sales of Southern iron in this district last week were very large, aggregating over 35,000 tons, according to figures furnished by all the sales agents. Northern furnaces made large sales, also—more than in the week previous. The interesting feature of the business was that while the aggregate sales were large, the business was divided among a great number of buyers, more, probably, than ever purchased in one week before, in this market. The largest sale of the week did not exceed 5,000 tons, and orders ranged principally in lots of from 200 to 1,000 tons. There are still a large number of inquiries in the market, and it is estimated by one of the most conservative dealers that 75 per cent of these will be placed within the present week. Buyers appear to have realized that there is not only every prospect of higher prices in the near future, but that there is more than a possibility of a shortage in iron for the next four to six months. Nearly all the furnaces are sold ahead for from three to six months on many grades, and some of them are entirely out of the market for the present, beign so heavily sold ahead as to be unable to book further orders. On Dec. 6, the Tennessee Coal, Iron & Railroad Co. advanced prices on its iron 25 cents a ton, and the other Southern furnaces followed suit before the end of the week. Most of the sales noted above were taken at the old prices. There is some talk of an advance in Southern freight rates, and furnaces refuse to make contracts beyond July 1, 1899, as they cannot contract for freight rates beyond that time. For the past several months freights have been in a demoralized condition, cuts of 25 cents a ton being freely made. It is said that the Southern roads are becoming firmer all the time, and it is not so easy to secure cut rates as formerly. Quotations are revised as follows:

Lake Sup. Charcoal	$11 50 @ $13 00	Southern Coke No. 3	$10 60 @ 10 85
Local Coke Fdy. No. 1	11 50 @ 12 00	Southern No. 1 Soft	11 10 @ 11 35
Local Coke Fdy. No. 2	11 00 @ 11 50	Southern No. 2 Soft	10 85 @ 11 10
Local Coke Fdy. No. 3	10 75 @ 11 00	Southern Silveries	11 75 @ 12 25
Local Scotch Fdy. No. 1	11 50 @ 12 00	Jackson Co. Silveries	12 50 @ 14 50
Local Scotch Fdy. No. 2	11 00 @ 11 50	Ohio Strong Softeners	12 00 @ 12 50
Local Scotch Fdy. No. 3	10 75 @ 11 00	Alabama Car Wheel	15 00 @ 16 00
Southern Coke No. 1	11 10 @ 11 35	Malleable Bessemer	11 00 @ 12 00
Southern Coke No. 2	10 85 @ 11 10	Coke Bessemer	11 00 @ 12 00

BARS.—Business last week was very satisfactory, and several quite good sized contracts were placed. The principal business continues to come from railroads and car works, but other buyers have placed good orders in the week. Common iron is selling at from 1c to 1.10c, according to quantity, specifications and the necessities of the selling mill; billet stock steel bars are quoted at 1.05c to 1.15c; guaranteed iron is quoted at 1.05c to 1.15c.

RAILS AND TRACK SUPPLIES.—Sales of standard sections in this market reached fully 125,000 tons last week, with further orders to come immediately. More than half of this business was closed by the local mills, and by far the larger part of the remainder was taken by mills in the Central Western agreement. A good many of the orders for small lots were taken at an advance of $1 over the minimum price of the agreement. Light rails are in good demand, and quite large sales were made last week. Quotations are made as follows: Standard section rails, $18 to $19; light rails, $20 and upwards; steel splice bars, 1.15c to 1.25c; track bolts with square nuts, 1.80c to 1.90c; hexagon nuts, 1.90c to 2c; spikes, 1.55c to 1.60c.

BILLETS AND RODS.—Sales of 15,000 tons of billets were made here last week by the local mills. The bulk of this was the closing of an old option given some time ago. Prices are made at $17. Rods are in large demand, but owing to the well sold condition of the local mills, sales are small. They are quoted at $22.50.

CAR ORDERS.—No large contracts for cars were placed last week, but a number of small orders are reported. Car ma-

terial continues in good demand, and excellent sales of material were made last week.

STRUCTURAL MATERIAL.—The eight-track bridge for the Drainage Canal, which was let several months ago, and has been in litigation ever since, will be re-let within a short time, as the court has decided the previous letting was illegal. Several large jobs in contemplation will come up in the near future. General business has been excellent the past week, considering the season of the year, and seems likely to continue so for some time. Quotations are as follows: Beams, 15 inch and under, 1.35c to 1.40c; 18-inch and over, 1.45c to 1.50c; angles, 1.25c to 1.30c; plates, 1.20c to 1.30c; tees, 1.40c to 1.45c; zees, 1.35c to 1.40c. Small lots from stock are quoted at ¼c to ½c higher.

PLATES.—The local mills closed orders for over 6,000 tons of plates last week, and considerable business for both mill and store shipment was placed with Eastern mill agents. The demand is very large, and the market is firm, with a higher tendency. We revise quotations as follows. Tank plates, 1.25c to 1.35c; flange steel, 1.35c to 1.45c; fire box steel, 1.85c to 5c.

SHEETS.—Sales last week were fully as large as those of the week previous, and show no signs of falling off. The demand for both black and galvanized sheets is excellent. Quotations are made at 1.95c to 2.05c for black sheets, and 80 and 7½ per cent off for galvanized.

MERCHANT STEEL.—There is a good general demand, and sales last week were ahead of the expectations of the mill agents. Specifications on old orders are coming in freely. Quotations follow: Open-hearth spring, tire and machinery steel, 1.65c to 1.75c; smooth finished machinery steel, 1.60c to 1.70c; smooth finished tire, 1.50c to 1.60c; tool-steel, 5.50c to 7.50c; specials, 11c and upwards.

SCRAP.—There is some demand for old iron rails, and several quite good sales were made last week. Old steel rails for remelting are also selling somewhat better. Cast scrap is in good demand, and sales last week were larger than for several weeks previous. Quotations are as follows:

Old iron rails, gross	$13 00@$13 50	Axles, net	$14 50@$15 00
Old steel rails, long, gr.	10 50@ 11 00	Cast borings, net	4 25@ 4 50
Old steel rails, short	8 75@ 9 00	Wrought turnings, net	6 00@ 6 50
Old wheels, gross	11 50@ 11 75	Axle turnings, net	7 00@ 7 25
Railroad forge, net	11 50@ 12 00	Mixed steel, gross	7 45@ 7 50
Dealer's forge, net	10 00@ 10 50	Stove plates, net	5 75@ 6 00
No. 1 mill, net	8 50@ 8 75	Heavy melting stee,gr.	8 25@ 8 50
Heavy cast, net	8 50@ 9 00	Old iron splice b., net.	12 75@13 00
Malleable cast, net	8 00@ 8 50		

CLEVELAND.

OFFICE OF *The Iron Trade Review and Industrial World*, 27 VINCENT ST., Dec. 14.

The last boat to load with ore for the season of 1898 was the Phenix, which took a cargo from Escanaba on Tuesday, Dec. 13, clearing for South Chicago. The total from all ports for 1898, as detailed elsewhere, is 13,650,000 tons. The all-rail shipments, which in the early months of the year were considerable to South Chicago, will carry the year's record over 14,000,000 tons, or somewhat beyond recent calculations. At some further properties, advances of wages have been announced the past week, and at all underground mines operations are going on as actively as is possible with the forces available. Such non-Bessemer mines on the old ranges as were able to operate on the fee-owning basis of prices which have ruled the past season have made large outputs. It is estimated that the consumption of old-range non-Bessemers in foundry and basic mixtures for the ore year ending May 1, 1899, will be close to 3,000,000 tons.

PIG IRON.—There has been no further heavy buying of Bessemer iron in the past week, but $10.25 at valley furnace has been quoted for limited quantities, while $10.50 is named as the figure on which first quarter business would be done by the furnaces. Sales have been made at $10.75, Pittsburg. Being all comfortably booked for the first four months of the year, with a fair tonnage also for May and June, the associated furnaces are quite secure in their position. It would seem, in view of conditions in steel and finished material, that the price of Bessemer in the next six months, as determined by supply and demand, will be quite satisfactory. For most of that time the average unsold product of the Bessemer furnaces is less than 2,500 tons a month each. Foundry iron is higher, and $9.75 in the valley for No. 2 is a common quotation on business for the first six months of 1899. Some producers are chary of contracting on that basis for more than six months ahead. Inquiry and buying have been active in the past week, some foundrymen ordinarily January buyers having come into the market. There is a disposition, too, to contract farther ahead than has been the custom. Southern furnaces have refused business from central territory in the week, and the question of getting iron equal to their needs and when it shall be wanted is one that may be faced by buyers of Southern grades, sooner than has been expected. Gray forge has advanced to $9 at valley furnace, some sales being reported. In other cases furnaces are holding for $9.25 and even $9.50 at furnace. On Southern forge $9.90 in the valley is minimum, but the inability of furnaces to take business is the chief feature, orders from valley mills for several thousand tons being refused the past week by Southern sellers because deliveries wanted could not be made. Connellsville furnace coke for 1899 is quoted $1.60. Some furnaces are fortunate enough to have contracts running several months into the new year. We quote pig iron f. o. b. Cleveland:

Bessemer	10 75	Valley Scotch No. 1	$10 65@10 90
No. 1 Strong Foundry	10 65@10 75	Valley Scotch No. 2	10 25@10 40
No. 2 Strong Foundry	10 25@10 40	Gray Forge	9 65
No. 3 Foundry	10 00	Lake Superior Charcoal	11 50

FINISHED MATERIAL.—Rail business has been up in the local market the past week, between 15,000 and 20,000 tons of standard sections being sold. A feature of recent demand as noted by concerns touching a variety of lines of trade is that in the past two weeks there has been a gradual filling up in departments that previously were not especially active, and those in which tney have been conspicuously overcrowded are a trifle improved in the matter of deliveries. Plate mills have all they can care for, as a rule, for the next six weeks, and some are sold 10 weeks ahead. The market is firm at 1.15c, Pittsburg. In bars there is a recovery from the weakness of the beginning of the month, some mills refusing orders below 1c, Pittsburg, for steel. The Cleveland quotation is practically the same. Bar iron is firmer, under the large demand for car material, and the advance in the price of raw material, though this has not been apparent in scrap to the same extent as in forge iron. There is a fair business in pipe. Sheets are unchanged at 1.95c Cleveland for No. 28 from mill. There is an advance in rods following that in billets and hence some sentimental betterment in wire and wire nails, though these are not expected to show decided improvement until the new demand appears after the first of the year. We quote wire at $1.12½ to $1.15, Cleveland, and wire nails at $1.25 to $1.30, Cleveland mill, according to size of order. Some new building projects are discussed locally and spring tonnage for the structural mills is likely to result.

CINCINNATI.

Dec. 13.

The flurry in the iron market last week came very much in the same unexpected fashion as the descent of the Assyrian, who "came down like a wolf on the fold." The largest producer in the South, absolutely without a note of warning, in the middle of the week advanced prices. There had been a steady and increasing demand previous to that time. For a day or two every furnace in the South was showered with orders, all at the old prices, for while the new prices are in force it is probable that very little iron as yet has been sold at them. Probably as much as 50,000 tons of iron was sold last week by the pig iron houses in this city; in fact, the general impression is that this buying movement was something of a sudden panic, so to speak, that will be over practically as quickly as it came; yet the situation is so uncertain that it is impossible at the present writing to tell much about it. The strength of the Birmingham iron market rests not on American conditions alone, but on foreign conditions as well. The steady demand upon Birmingham for iron for export at higher prices than the local market would give was responsible for this last advance in prices. It was not the home demand that did it; so one must now take into consideration in discussing the Southern iron market European as well as American conditions. All kinds of iron have been in request, Bessemer and charcoal being prominent, but the chief and exciting demand has been for Southern product, particularly in the No. 3, No. 4 and gray forge grades. The business in Northern foundry iron has been up to the fullest normal mag-

Continued on page 7

THE IRON TRADE REVIEW
AND
INDUSTRIAL WORLD.

DEVOTED TO MACHINERY, METAL-WORKING AND FOUNDRY TRADES AND IRON AND STEEL MANUFACTURE.

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CHICAGO:
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ENTERED AT THE POST OFFICE AT CLEVELAND, O., AS SECOND CLASS MATTER

DECEMBER 15, 1898.

THE cumulative effect of the splendid crops of 1896, 1897 and 1898 is now being felt in the iron trade in a way that warrants most hopeful predictions for 1899. Car shortages have been complained of at intervals in the past two years, but in the closing months of 1898 their handicap upon business has been more strongly accented than ever. Figuring from reliable estimates of the effective life of freight cars, 100,000 should go to the scrap pile each year; and approximately that was the average in 1892 and the two years preceding. But for the five years preceding 1898 the yearly average of car building has been between 40,000 and 45,000. It can be seen that the car orders which in this second half of the year have been filling up the car works able to build at the low prices now prevailing, are only a good beginning in the work of rehabilitation that is quite overdue. To the bar mills, wheel foundries and axle works which have been the iron trade's chief beneficiaries in the distribution of car work, are now to be added the plate mills, which are promised a growing share of the prosperity that has come to the railroads. At 12 tons to the car, nearly 100,000 tons of plates is already represented in the orders that have been placed for steel cars.

THE situation not only in Bessemer but in non-Bessemer irons is such to-day that no great effort would be required, if a boom program were deliberately determined on, to set prices forward materially. But against such a consummation the wise heads in the trade will certainly use every endeavor. It has been the wonder of every student of the situation in the past six months, that so even a level has been preserved in all iron products, in view of the frequently rehearsed elements of strength, that under the old regime of great fluctuation would have given the market a sharp turn upward. Two weights on the safety valve have been the evident determination of producers to hold prices well below the point of temptation to idle works, and the resolute purpose to push the advantage already gained in foreign fields. In line with this policy the coke price for 1899 is put on a conservative basis, considering the larger return promised to all manufacturers of iron and steel. The feeling in the Lake Superior ore trade likewise leans well toward caution. Therefore if any large advance comes in pig iron or in finished lines, it will not be because costs have compelled it. Leading interests appear to have set their faces steadily toward outer markets, recognizing that this trade is already the balance wheel of the American iron industry, and is to be more and more a controlling influence. It would take no large amount of speculative buying in pig iron or steel to start prices toward a basis that would be unhealthful to a degree, and sure to be attended by reaction at home and the blighting of our iron trade abroad. There is no reserve capacity worth mentioning that can come in, at to-day's prices, nor at an advance of $1. Moreover, so far as blast furnaces are concerned, an ore supply is not available for any appreciable addition to to-day's production. In the Central Western district two modern furnaces will be ready in April, and by the end of the year two more in the Central district and one at Pittsburg. But all this applies on Bessemer capacity. Meantime in foundry grades there is promise of more business in the first half of 1899 than can be taken care of, if the present rate of export continues. It is most significant, in this connection, that the advance in Southern iron which came last week was due immediately to the fact that etter net prices could be secured on export iron, in spite of high ocean freights, than for iron sold at home. The developments of the next three months promise to be extremely interesting.

THE story of Edison's triumphs in connection with the concentration of the low-grade ores of New Jersey has been told over again recently in some of the metropolitan newspapers. One story holds him up as a victim of the "Carnegie-Rockefeller ore monopoly" that—strange freak for a wicked monopoly—has made the price too low. Another article says that his magic has won and that he will soon control the iron ore trade of the Eastern States. There is wide room here for a statement with truth in it. Mr. Edison is quoted as saying that he now reduces 1,800 to 2,000 tons a day of gneiss rock and gets from it 475 tons of ore briquettes. At 300 working days in the year, this would mean 142,500 tons in a year. There are 50 mines in the Lake Superior region, each capable of that amount a year, which is just about 1 per cent of the total production of the Lake Superior ranges this year, and much less than half the ore consumption of a single modern furnace. Moreover, reckoning the interest on Mr. Edison's $2,000,000 plant at $120,000 a year, here is over 85 cents interest charge per ton of ore. Mechanically the plant at Edison, N. J., is a wonder; commercially it cannot be seriously considered as a factor in the ore situation.

THE official statement of iron and steel exports has accumulating interest. In October, as the table

below shows, there was sent out from the United States about 40,000 tons of pig iron. This amount might have been increased, had ocean freights been on an ordinary basis. Bessemer iron is wanted on the other side and we know of negotiations for a 50,000-ton lot with valley producers, but the high ocean freights gave but $9 to $9.25 net to the furnace, and the matter, after being thoroughly canvassed, was dropped. But the circumstance illustrates what is in reach of our iron manufacturers. It will be seen in the table below that the October exports increased greatly in nearly every line over those of October, 1897:

EXPORTS OF IRON AND STEEL FROM THE UNITED STATES—GROSS TONS.

	October.		January—Oct.	
	1897.	1898.	1897.	1898.
Pig iron { ferro	824	33	3,881	3,514
Pig iron { all other	26,867	39,458	194,908	180,826
Scrap	2,978	9,496	35,671	65,307
Bar iron	357	891	3,744	5,481
Steel bars (not wire rods.)	792	780	37,416	18,953
Iron rails	58	3,685	5,073	5,492
Steel rails	20,243	23,456	108,816	246,430
Billets, ingots and blooms	338	1,428	*3,681	21,456
Hoop, band and scroll iron	423	384	994	966
Wire rods	1,852	3,764	*8,163	15,083
Iron sheets and plates	346	237	3,231	3,190
Steel sheets and plates	897	1,519	3,340	21,628
Tin plates, terne plates, and tagger's tin	†	6	†	28
Structural material	3,668	2,152	*10,373	29,246
Wire	4,928	6,186	43,015	60,206
Cut nails	985	1,199	5,966	12,195
Wire nails	566	2,957	3,740	13,953
Other, including tacks	157	175	2,917	1,692
	66,279	97,806	474,929	705,646

(*) Not separately stated prior to July, 1897.
(†) " " " " " Dec., 1897.

Personal.

Major L. S. Bent, chairman of the Pennsylvania Steel Co., is reported in a Santiago de Cuba letter as speaking on behalf of the iron ore interests at a dinner given at Santiago, Dec. 3, by Robert P. Porter, on his return from an inspection of the iron mines in the Santiago district.

W. H. Applegate has been put in charge of an office just opened by Rogers, Brown & Co., at Birmingham, Ala.

It is a pleasure to know that P. H. Moore, editor of the *Ohio Valley Manufacturer*, of Wheeling, who has long commented on the course of the iron trade over the signature "Cold Steel," is recovering from the effects of a recent severe stroke of paralysis.

J. H. LeFevre, for nine years connected with the Pennsylvania Steel Co., took charge of the new slabbing mill of the Illinois Steel Co., on Dec. 1.

A. J. Boyce, proprietor of the Industrial Foundry & Machine Works, East Liverpool, O., died suddenly last week, of paralysis of the heart.

C. L. Budd and I. H. Rogers, of Vivian & Budd, steel manufacturers, of Manchester, Eng., who were in Pittsburg recently, in company with B. Nichols, a New York iron broker, are said to have given export contracts for billets, slabs and plates. It is reported that the business was distributed among Pittsburg, Wheeling and Middlesborough, Ky., steel works, Pittsburg works not being able to make deliveries desired on the whole order.

E. S. Lewis, a pioneer iron manufacturer of Cleveland, has disposed of his interest in the Lake Erie Iron Works, of which he was vice-president, to Wm. C. Scofield, and the latter's sons, and has retired from active business life. In March, 1841, Mr. Lewis entered the iron store of W. A. Otis & Co., Cleveland, remaining in his position for 13 years. In 1859 he took a one-third interest in the firm, and in 1872, together with W. C. Scofield, he purchased the mills owned by the company, which have since been operated under the name of the Lake Erie Iron Works.

E. W. Craig, U. S. N., late of the battleship Texas, has been appointed inspector of hull material at Munhall, Pa., and Chief Engineer Walter E. Worthington, U. S. N., late of the Brooklyn, has been placed in charge of the inspection of steam engineering material in the Pittsburg district. These two officers will divide between them the work which up to the present time has been done by Chief Engineer Daniel P. Jones, who will be retired on half pay by the Navy Department.

Cincinnati Market—Continued from page 5.

nitude, and some of the important Ohio furnaces making Lake Superior coke irons have advanced their prices 25 cents per ton. The large buying is evidently all legitimate, the speculators not having appeared in the market. Consumption continues apparently at the fullest volume the country has ever known. Rolling mills and steel works seem to be assured of ample business to run full through the winter. The manufacturers of agricultural implements are receiving such orders as will require their running to their fullest capacity. We quote f. o. b. Cincinnati: Southern Coke, No. 1 foundry, $10.25 to $10.50; No. 2, $10 to 10.25; No. 3, $9.50 to $9.75; No. 4 and gray forge, $9 to $9.25; mottled, $9 to $9.25; No. 1 soft, $10.25 to $10.50; No. 2, soft, $10.00 to $10.25; Hanging Rock charcoal, No. 1, $14.75 to $16; Jackson Co. silvery, No. 1, $12 to $12.50; standard Georgia car wheel, $14.25 to $15.

PHILADELPHIA.

Dec. 12.

The events of the past week have strengthened the feeling in the pig iron market. Some buying of Southern iron is reported, two sales of 10,000 tons each having been made, besides others ranging from carload lots up to 2,000 tons. Eastern furnaces have been making fair sales also, and there has been evident desire of foundry interests to cover for the first half of next year at present prices. This the furnaces have been willing to do. It has not been the immediate necessities of buyers that have brought them into the market, but the feeling that iron is a good purchase at the figures recently prevailing. We quote the following seaboard prices: No. 1X foundry, $12 to $12.50; No. 2X foundry, $11.25 to $11.50; No. 2 plain, $10.75 to $11; standard mill iron, $10.40 to $10.60; ordinary mill iron, $10.25; basic, $10.60; Lake Superior charcoal, $15.25. In steel there is some inquiry, and it would appear that some buyers have let their opportunity pass for covering for the first quarter of the new year. The quotation is now firm at $17.50, as against $16.75 and $17 a few weeks ago. The real situation in steel has evidently not been fully appreciated. There is good activity in finished material, and the mills are well supplied with winter work, but at no better prices than those long maintained. The foreign business is going on, in spite of the high freights. Shipyards on the other side are calling for material from this country. A Southern Australian order for 4,000 tons of plates was taken by an Eastern mill, and a portion of the Coolgardie tonnage is being distributed, about half of it being placed, while negotiations are on for the balance, though the mills are loath to load up with this business, in view of the amount of work at home that is insured for next year. There is a belief that as prices of pig iron and steel are getting firmer, some betterment may come in finished material. Rail orders continue and Eastern mills have booked a fair tonnage, though not so much can be said for the price. We quote special bar iron at 1.25c to 1.30c; steel bars at 1.10c to 1.15c; plates, at 1.30c to 1.35c; angles, 1.25c to 1.30c; beams and channel up to 15 inches, 1.40c.

Sheet Manufacturers' Meeting.

The Iron and Steel Sheet Manufacturers' Association held a regular monthly meeting at its headquarters in the Conestoga Bldg., Pittsburg, Tuesday of this week. The attendance was only moderate. At the morning session, which was attended only by the regular members of the association, it was stated that routine busines was transacted. The afternoon session was an "open meeting," a number of sheet and galvanized iron manufacturers being present who are not members of the association. The time was given over to an informal discussion of trade conditions. A committee was appointed to draft a schedule of advances for black and galvanized sheets. It will be remembered that the association now includes manufacturers of galvanized iron, the separate association for this branch having been wound up some time ago.

It is stated that the small muck bar plant of the Wilkes Rolling Mill Co., Sharon, Pa., will be put in operation the beginning of the year, after a long idleness, the product for some time ahead having been sold to the Sharon Iron Co.

THE RIVERSIDE BY-PRODUCT COKE PLANT.

Work was completed recently upon the plant of 60 by-product ovens built by the Semet-Solvay Co., of Syracuse, N. Y., for the Riverside Iron Works, at the furnace plant of the latter at Benwood, W. Va. For the past 10 days the entire block of ovens has been in operation, the start having been made a few weeks previous and the number of active ovens added to week by week. The 60 ovens will carbonize about 300 tons of coal a day, making approximately 225 tons of coke, which will be used in the adjoining blast furnaces. Connellsville coal will be used exclusively, and it is expected that the quality of the coke will be equal to the standard Connellsville product. While the coke yield of Connellsville coal in the bee-hive oven is about 65 per cent, the retort oven will give a regular yield of from 71 to 72 per cent of commercial coke, or a gain of about 10 per cent, which in itself is counted a good return on the investment. There is also more rapid coking in the retort oven, although the individual charges are smaller. It is estimated that 60 ovens of the Semet-Solvay type will equal in output about 150 bee-hive ovens making 48- and 72 hour coke. A comparison of the labor required is found in the statement that at Ensley, Ala., a bee-hive plant of 300 ovens requires 1,020 hours labor per day, and a Semet-Solvay plant of 120 ovens, 732 hours labor each day.

Each ton of the Connellsville coal used at Riverside plant yields about 9,000 cubic feet of gas in the distillation, and 60 per cent of this is used for operating the ovens and recovery apparatus. The remainder, about 3,500 cubic feet to the ton of coal is available for use or for sale.

The gas is of high quality, giving about 600 British thermal units per cubic foot and 10 to 12 candle power. It is practically an unenriched illuminating gas. The Riverside Iron Works will convey this gas to the adjoining wrought pipe works at Benwood, where it can be used to advantage. The value of this gas in fuel applications is much greater than its comparative heat units as compared with coal. The expense of stocking and removing ashes is avoided, and the nature of the heat in the form of gas gives it an efficiency rated nearly double that of coal. On account of its chemical composition it is equal to natural gas in efficiency, although of considerably lower heat units. Natural gas requiring a large amount of air to burn it completely, introduces a much greater amount of inert nitrogen than is required by coke oven gas. The value of the gas in its fuel applications is counted good interest on the investment.

The by-product works, which are seen back of the ovens in Fig. 1, are arranged to recover tar, ammonia and other secondary products. A set of gas condensers is provided for each 30 ovens and the sulphate of ammonia house adjoins them. This is equipped with exhausters, washers, pumps, tanks, etc., for collecting the by-products. In the tar-distilling plant, which is separate, the tar collected from the gas, after being measured, is pumped directly from the by-broduct building to its receiving tanks. From tar distillation are produced roofing pitch, tar paper and creosoting oils. The ammonia is manufactured into sulphate of ammonia. As the ammonia is condensed out of the gas it is collected in the form of a weak liquor. This is distilled with steam and the resulting ammonia gas is absorbed in a bath of sulphuric acid contained in a tank. The crystals of sulphate fall to the bottom whence they are raked out. The value of the by-products is sufficient to cover the entire cost of operating the oven plant. The net cost of the coke, therefore, will be no greater than the delivered cost of the coal required to make it.

The coal is brought to the plant on an elevated trestle and dumped from the cars into crushers which reduce it to slack. It is then conveyed by elevators to the bins over the ovens, from which it is drawn by gravity into the coal larries running along the tops of the ovens. Three larries discharge simultaneously into one oven and their contents fill one oven. The time of charging is about 10 minutes. When the oven of coke is ready to be drawn the doors at each end are opened and the steam ram which runs upon a track beside the ovens pushes the coke out upon the inclined quenching car. This traverses the track in front of the ovens as they appear in Fig. 1. The fall is only about three feet. After the coke is quenched upon the car, the latter is pushed by a small locomotive up the blast furnace stock-house trestle and discharged on to a sliding platform into the coke bins. Thence it is drawn into the barrows for the furnace. This method of handling the coke from the ovens to the furnace insures its transportation with no loss by abrasion or rough handling and free from the varying quantities of moisture incident to long transportation by rail, and repeated loading and unloading.

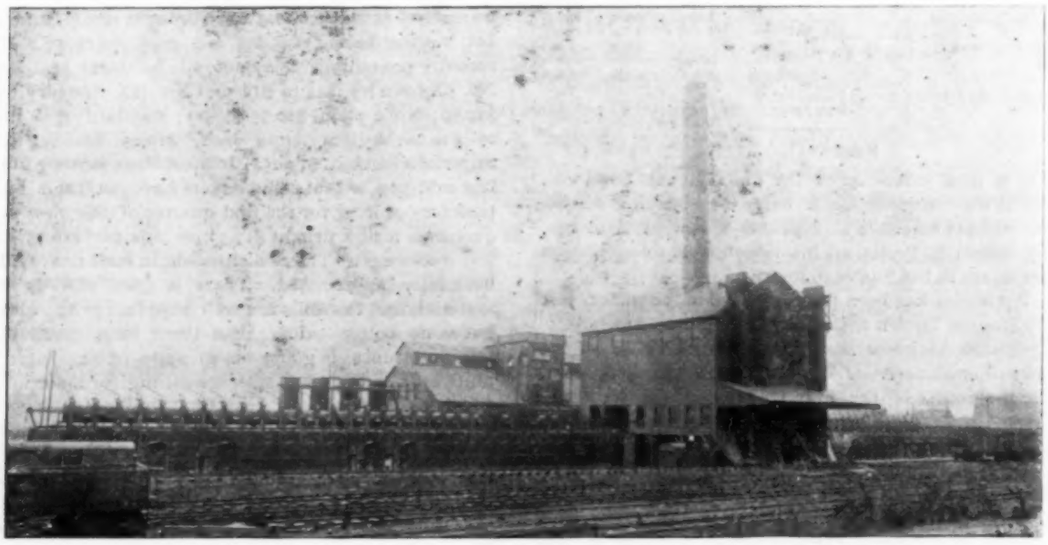


FIG. 1.—BY-PRODUCT COKE PLANT OF THE RIVERSIDE IRON WORKS, BENWOOD, W. VA.

The cost of the plant at Benwood is about $240,000, and it is expected that a second one of equal size will be added at an early day.

At Pittsburg, the annual convention of the Manufacturers' Association of Brass and Iron Goods for Gas, Steam and Water adjourned last week. The election of officers resulted as follows: Theodore Ahrens, Louisville, president; George T. Coppins, Boston, first vice-president; A. D. Sanders, Chicago, second vice-president; W. T. Doyle, Milwaukee, secretary, and J. V. Kalvelege, Milwaukee, treasurer.

W. S. Rockwell & Co., New York, have just erected at the Washington Navy Yard one of their large size double-end oil annealing furnaces and their improved duplex system for burning fuel oil. They have also just completed an annealing and tempering equipment for the Niagara Silver Co., Niagara Falls, N. Y., consisting of one of their oil annealing furnaces, one tempering furnace and their improved duplex system for burning fuel oil.

PLANTS IN THE TIN PLATE DEAL.

The formal transfer of the tin plate plants absorbed by the tin plate consolidation is being made in Chicago this week. The inventories at a number of the plants were completed by the beginning of this week, permitting them to be turned over. It has been rumored that the new concern had made or was making some deal with one or more bar mills by which certain advantages were to be secured, but this report is flatly denied in the bar trade. The secrecy which has characterized the movements of the promotors of this enterprise continues, and but little information as to the policy or the make up of the new organization can be secured. Lists have been published of the mills taken into the combine, which contain several errors. It should be noted that at a number of plants enlargements were in progress when the options were given, and as soon as the thing assumed definite shape, agreements were entered into with these manufacturers to stop at once all work of enlargement, so that plants which have been credited with a certain number of mills, built or being built, will never have the number given. This materially scales down the number of mills taken into the consolidation, though of course it does not increase the number left outside, the most important of which are the Canonsburg Iron & Steel Co., Pittsburg, with five completed mills and three under construction, the Lalance & Grosjean Mfg. Co., Harrisburg, Pa., four mills completed, and the St. Louis Stamping Co., St. Louis, Mo., with eight completed mills. The two latter concerns have been making tin plate only for their own use, market conditions being such as not to prompt them to go out into the market. The St. Louis plant has a fine open-hearth steel plant with blooming and bar mills. Quite recently several of the mills which were holding off have been brought into the fold, but in addition to the three named, it is probable that a small Wheeling mill will not be taken over, while there have been no negotiations at all in connection with the concern now erecting a plant at Avonmore, Pa. Following is a correct list of the plants being absorbed, with the number of completed mills of each, it being noted that the 30-mill plant at New Castle has not yet been put in operation, though virtually completed:

Aetna-Standard Iron & Steel Co., Bridgeport, O., 8 mills.

American Tin Plate Co., Elwood, Ind., 20 mills, and Montpelier, Ind., 6 mills.

Atlanta Steel & Tin Plate Co, Atlanta, Ind., 5 mills.

Baltimore Tin Plate Co., Baltimore, Md., 2 mills.

Beaver Tin Plate Co., Lisbon, O., 6 mills.

Blairsville (Pa.) Rolling Mill & Tin Plate Co., 2 mills.

Britton Rolling Mill Co., Cleveland, O., 3 mills.

Cincinnati Rolling Mill & Tin Plate Co., Cincinnati, O., 4 mills.

Crescent Sheet & Tin Plate Co., Cleveland, O., 6 mills.

Cumberland (Md.) Steel & Tin Plate Co., 5 mills.

Ellwood Tin Plate Co., Cleveland, O.; works, Ellwood City, Pa., 5 mills.

Falcon Tin Plate & Sheet Co., Niles, O., 6 mills.

Great Western Tin Plate Works, Chicago; works, Joliet, Ill., 4 mills. (Works partially destroyed by fire recently).

Hamilton & Co., West Newton, 2 mills.

Humbert Tin Plate Co., Connellsville, Pa., 6 mills.

Irondale Steel & Iron Co., Richmond, Ind; works, Middletown, Ind., 6 mills.

Johnstown Tin Plate Co., 69 Wall st., New York; works, Johnstown, Pa., 2 mills.

La Belle Iron Works, Wheeling, W. Va., 10 mills.

Laughlin Nail Co. Martin's Ferry, O., 14 mills.

Marshall Bros. & Co., Philadelphia, Pa., 6 mills.

Monongahela Tin Plate Co., Pittsburg, 14 mills.

Morewood Co., Gas City, Ind., 8 mills.

FIG. 2.—RIVERSIDE IRON WORKS—BY-PRODUCT COKE PLANT AND BLAST FURNACE STOCK HOUSE.

Morton Tin Plate Co., Cambridge, O., 6 mills.

National Tin Plate Co., Anderson, Ind., 6 mills.

National Tin Plate Co., Monessen, Pa., 6 mills.

Neshannock Sheet & Tin Plate Co., New Castle, Pa., 6 mills.

New Castle Steel & Tin Plate Co., New Castle, Pa., 20 mills.

Ohio River Sheet & Tin Plate Co., Remington, Pa. (P. O., Agnew), 2 mills.

Pennsylvania Tin Plate Co., New Kensington, Pa., 6 mills.

Pittsburg Tin Plate Co., New Kensington, Pa., 6 mills.

Reeves Iron Co., Canal Dover, O., 4 mills.

Shenango Valley Steel Co., New Castle, Pa., 30 mills.

Somers Bros., Brooklyn, N. Y., 3 mills.

Star Tin Plate Co., Pittsburg, 8 mills.

Stickney Iron Co., Baltimore, Md., 2 mills.

United States Iron & Tin Plate Mfg. Co., Demmler, Pa., 5 mills.

Wallace, Banfield & Co., Irondale, O., 4 mills.

Washington Steel & Tin Plate Mills, Washington, Pa., 4 mills.

This makes a total of 39 plants, owned by 38 separate concerns, and containing 268 mills. Several of the plants have not been in operation for some time and others have only been run spasmodically.

13,650,788 TONS FOR 1898.

A GREAT SEASON'S RECORD IN IRON ORE.

The last cargo of iron ore for 1898 was loaded at Escanaba Tuesday, Dec. 13, or one day later than the close of shipments for 1897. The season has established a new record for Lake Superior iron mines—a total sent over upper-lake docks of 13,650,788 gross tons, as compared with 12,215,645 tons by water in the season of 1897. Yet this output is not up to the evident consumption of Lake Superior ores. Easily 500,000 tons more would have been brought down, could the labor have been secured at the height of the shipping season. The Mesabi range, with a total shipment of 4,604,912 tons, has contributed 32.6 per cent of the total for 1898—if we reckon the all-rail shipments at 450,000 tons, and thus make the total for the year 14,100,000 tons. In 1897 the Mesabi percentage was 34 and in 1896 it was 29. The all-rail shipments will be higher for this year than for several preceding, in view of the large amount of ore sent to South Chicago last winter.

Producers of Bessemer ores have had a fair return out of the season's business, as compared with last year. Non-Bessemer ores have sold at unheard of prices, some of the old-range grades going even below Mesabis. Only mines operated by fee-owners could make ends meet at the prices paid for non-Bessemers the past year—$1.85, for example, for an ore that heretofore has brought $2 to $2.10. Vessel interests have not profited by the year's ore trade except in the case of companies owning boats of most modern capacity.

SHIPMENTS FROM UPPER-LAKE PORTS.

The table below gives the amount of ore shipped this year from each of the Lake Superior ports. The order of last year, as determined by tonnage, is changed. Escanaba again leads. Two Harbors is second and Duluth is third. For comparison, the figures of the five preceding years are given also:

LAKE SHIPMENTS OF IRON ORE, GROSS TONS.

	1898.	1897.	1896.	1895.	1894.	1893.
Escanaba	2,803,513	2,302,121	2,321,931	2,860,172	1,644,776	2,048,981
Marquette	2,245,973	1,945,519	1,564,813	1,079,485	1,424,850	1,086,934
Ashland	2,391,088	2,067,637	1,566,236	2,350,219	1,738,598	1,117,520
Two Harbors	2,693,245	2,651,465	1,813,992	2,118,156	1,373,253	903,329
Gladstone	335,956	341,014	220,887	109,311	79,208	203,585
Superior	550,403	531,825	167,245	117,884	.....	80,273
Duluth	2,630,610	2,376,064	1,988,932	1,598,783	1,369,252	449,592
Total by lake	13,650,788	12,215,645	9,644,036	10,233,910	7,629,829	5,891,214
Total all rail	.....	.....	290,792	195,127	118,394	178,037
Total shipm'ts	.....	.....	9,934,828	10,429,037	7,748,223	6,069,251

Taking the amount received at Lake Erie ports from the otal as above, 13,650,788 tons, gives the total water shipments to South Chicago, Bay View and such of the charcoal furnaces as are reached by water. The amount that did not go to Lake Erie is thus 2,622,467 tons. It is known that all-rail ore to South Chicago previous to the opening of navigation this year was close to 400,000 tons. It is entirely probable, then, that the year's shipments from Lake Superior mines will prove to be about 14,100,000 tons.

LAKE ERIE RECEIPTS, 11,028,321 TONS.

Publication of the receipts at Lake Erie ports has been withheld to the present week, so as to make the record complete. In a few cases cargoes scheduled to arrive after the report was sent to us from the dock, were estimated. The total of receipts, it will be seen, is about 1,000,000 tons greater than for 1897. The aggregates of the two tables below, showing receipts and stocks on dock Dec. 1 are as follows:

Receipts at Lake Erie ports, season of 1898, 11,028,321 tons.
On docks at Lake Erie ports, Dec. 1, 1898, 5,136,407 tons.

The figures we printed in May, 1898, showed ore on Lake Erie docks amounting to 3,167,915 tons. Adding the receipts for the season and subtracting the amount on dock Dec. 1, 1898, shows that the shipments to furnaces since May 1 (including ore taken directly into furnace yards at Tonawanda, Buffalo and Cleveland, and 64,100 tons in boats tied up at Lorain, for the Lorain Steel Co.) reached the unprecedented total of 9,059,829 tons. The figure for 1897 was 7,453,648 tons; for 1896, 5,021,146 tons; for 1895, 6,339,496 tons. It will be seen that the direct shipment of ore has vastly increased, and that the putting of ore on docks is to grow less and less. Even with the large increase in direct ore, the shortage of cars prevented the taking from vessel direct to furnace all the ore that the furnaces could have provided for. Shipments from the docks to the furnaces promise to be large between this date and May 1, 1899. The following table gives receipts at Lake Erie ports in 1898 and the five years preceding:

IRON ORE RECEIPTS AT LAKE ERIE PORTS, GROSS TONS.

Ports.	1898.	1897.	1896.	1895	1894.	1893.
Toledo	414,012	416,438	301,794	260,730	158,384	145,515
Sandusky	136,200	79,792	58,667	12,361	23,043	4,464
Huron	126,755	198 231	226,515	146,442	174,775	137,700
Lorain	536,086	355,188	191,443	214,219	150,424	165,667
Cleveland	2,645,318	2,456,704	2,313,170	2,312,370	1,624,573	1,260,716
Fairport	912,879	1,008,340	941,446	914,617	976,222	792,517
Ashtabula	2,684,563	3,001,914	2,272,822	2,474,791	1,987,722	1,845,738
Conneaut	1,404,169	495,327	327,623	244,967	237,905	203,207
Erie	1,092,364	1,311,526	847,849	811,989	624,438	469,399
Buffalo, Tonawanda	1,075,975	797,446	545,101	719,742	395,339	308,238
Total	11,028,321	10,120,906	8,026,432	8,112,228	6,350,825	5,333,061

Ashatubla and Cleveland are close together, it will be noticed, though last year Ashtabula was 550,000 tons ahead. Conneaut promises to dispute first place with them by another season. The table following gives the amount of ore on dock Dec. 1:

IRON ORE ON LAKE ERIE DOCKS, DEC. 1, GROSS TONS.

Ports.	1898.	1897.	1896.	1895.	1894.	1893.
Toledo	146,568	194,644	151,959	113,132	96,157	92,911
Sandusky	48,500	84,786	59,491	34,375	77,004	78,439
Huron	139,982	230,029	200,075	101,000	147,632	89,000
Lorain	324,034	317,509	231,288	224,264	223,732	201,632
Cleveland	1,175,970	1,478,355	1,419,311	1,200,792	1,441,785	1,163,930
Fairport	719,794	825,312	773,905	605,470	660,980	578,033
Ashtabula	1,732,671	1,835,694	1,441,666	1,301,302	1,439,119	1,296,431
Conneaut	288,101	360,895	275,800	292,460	199,365	91,337
Erie	439,167	484,871	355,222	335,718	454,233	359,827
Buffalo	121,620	111,660	82,367	207,199	94,239	119,170
Total	5,136,407	5,923,755	4,954,984	4,415,712	4,834,247	4,070,710

It will be seen that dock stocks are nearly 800,000 tons less than at this time last year.

OUTPUTS OF CERTAIN RANGES AND MINES.

To make complete the record of Lake Superior iron ore shipments for 1898, there must be included the all-rail shipments from certain mines to the charcoal furnaces of Michigan and Wisconsin and any other shipments made by all-rail routes. As some all-rail ore is generally shipped in December, that factor cannot be fully counted until the end of the year. In the case of the Mesabi and Vermilion ranges, however, it is safe to say that there was no all-rail ore and that the ore passing over the docks at Duluth, Two Harbors and Superior represents the entire shipment of the year. In the following statement, the Lone Jack and Mesabi Mountain are put together as Oliver:

ORE SHIPMENTS FROM MESABI RANGE, 1898.

	GROSS TONS.		GROSS TONS.
Mountain Iron	650,021	Penobscot	29,652
Oliver	385,792	Mahoning	520,751
Hull, Burt & Rust	129,510	Auburn	235,631
Day	18,725	Norman	110,141
Pillsbury	99,691	Payal	575,933
Sellers	112,725	Genoa	279,677
Duluth	112,155	Sparta	226,154
Adams	390,770	Elba	564
Ohio	65,597	Sample Car	25
Biwabik	383,179		
Franklin	200,273	Total	4,604,912
Commodore	77,946		

This is against an output for the Mesabi range in 1897, of 4,280,873. The increase over last year is thus about 324 000 tons. The shipments from the mines on the Vermilion range and from some of the prominent mines on other ranges were as follows, the figures in some cases being exact and in other cases in even thousands:

	GROSS TONS.		GROSS TONS.
Minnesota	427,764	Montreal	970,777
Chandler	714,857	Palms	161,557
Pioneer	123,183	Norrie	896,000
Cleveland-Cliffs	865,900	Chapin	722,000
Lake Angeline	463,040	Penn. Iron Mining Co.	223,500
Lake Superior	690,000	Aragon	328,000
Champion	163,200	Aurora	132,656
Negaunee	191,000	Newport	206 000
Winthrop	122,770	Commonwealth	242,000
Tilden	287,203		

THE Chandler mine at Ely, Minn., has announced a 10 per cent advance in wages, bringing the schedule back to the basis of 1892. This second increase this season is due to the demand for miners from the copper country.

A WELL EQUIPPED STEEL FOUNDRY.

Important improvements and additions have been made at the steel foundry department of the Otis Steel Co.'s Works, Cleveland, the work being prolonged by reason of the urgency of orders, which made it impossible to suspend operations. Thus construction and replacement work went along side by side with manufacturing. The main foundry building has been lengthened 175 feet, 100 feet at one end and 75 feet at the other, making the present length 340 feet. The width is 70 feet. An annex which is devoted to cleaning and chipping castings, is 320 feet long by 30 feet wide. A new open-hearth furnace has been built having a capacity of 15 tons; a Wellman charging machine has been installed; the hydraulic jib cranes in the foundry have been superseded by four electric traveling cranes, and for the gas supply for the open-hearth furnace two gas producers 10½ feet in diameter have been provided. The new open-hearth furnace gives two that are available for the steel department. The old furnace, which stands beside the new one, is yet to be turned about, so that it, too, may be commanded by the Wellman charging machine.

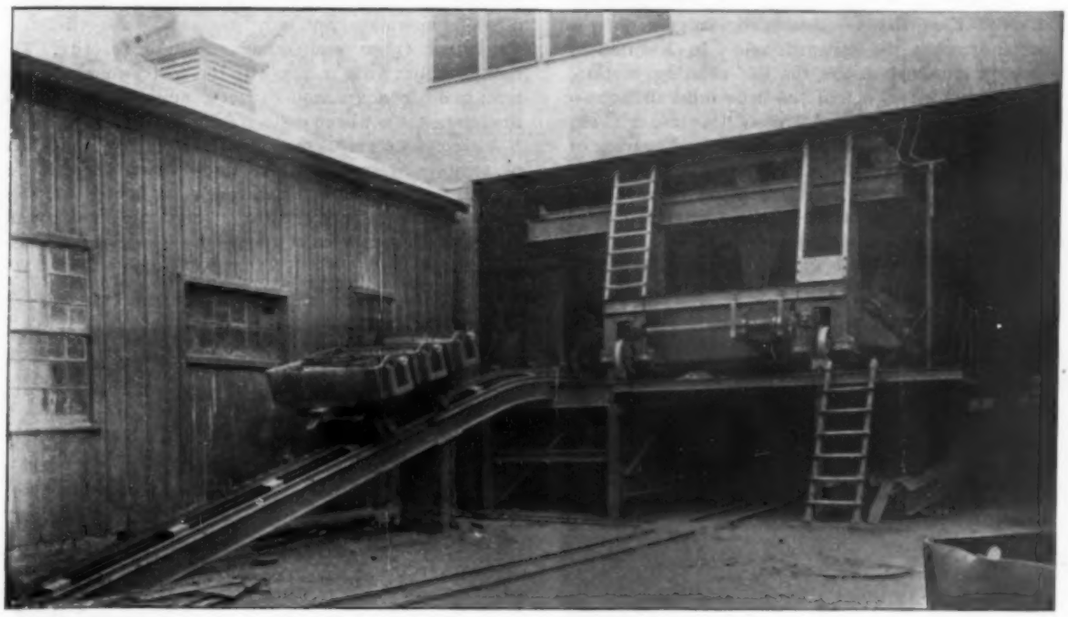


FIG. 1.—OTIS STEEL CO.'S STEEL FOUNDRY—VIEW OF INCLINE AND CHARGING MACHINE.

Three of the new traveling cranes were built by the Shaw Electric Crane Co., of Muskegon, Mich. One is a 25-ton crane with a 5-ton auxiliary hoist; the others are of 10 tons capacity each The fourth, also a 10-ton crane, was furnished by the Wellman-Seaver Engineering Co., of Cleveland. The 25-ton crane is equipped with a 27-h. p. motor for hoisting, a 4¼-h. p. motor for trolley traverse and a 14-h. p. motor for bridge traverse. The motors for the three motions of the 10-ton cranes are 14-h. p., 2¼-h. p. and 8¼-h. p. respectively. These four cranes and a 5-ton Brown electric crane in the cleaning room give a very effective handling equipment and afford important economies over the displaced outfit of jib cranes. The span of the four cranes in the foundry is 67 feet 6 inches. The girders of the Shaw crane are of box section, mounted on structural steel track beams, carrying the bridge wheels. The trolleys are all of special design, being made unusually low on account of the limited room between the tops of the furnaces and the lower side of roof chords. On each crane, the hoisting train is provided with both magnetic and mechanical brakes, which work independently and in combination. Either brake is capable of sustaining the regular service load. Through them promptness in starting and stopping, and delicacy of control in lowering the load are secured. The bridge traverse movements are provided with foot brakes. Hoisting is effected by special flexible steel wire rope, which possesses great strength and is capable of being run over comparatively small drums and sheaves without deterioration. The motors and controllers are of the Shaw Electric Crane Co.'s make, all specially designed and built for crane service.

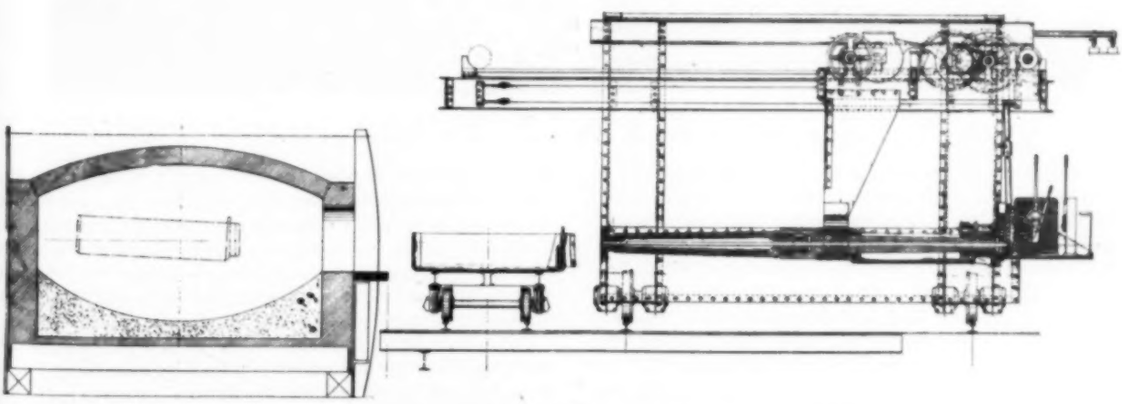


FIG. 2.—SECTION THROUGH CHARGING MACHINE, CAR AND OPEN-HEARTH FURNACE.

The Wellman charging machine is of the overhead type. The machine consists of a steel frame carried on four steel wheels that are actuated by an electric motor. This frame work supports four steel columns, on which are carried, 10 feet 8 inches from the floor, two steel beams 8 feet apart. These beams project toward the furnace over the track on which stand the charging cars carrying the boxes. On these beams a carriage runs and on its front end are hung the supports for the charging bar. The charging bar has trunnions

at its middle point. It is T-shape at the front, to fit in a recess on the back of the charging box. The operator's cab at the back end of the charging bar carries, beside the operator, the electric controllers and a 2-h. p. motor for turning the bar; also a lever for throwing in the bar, to lock the box to the charging bar. A train of gearing connects a motor on the carriage above with a shaft, on each end of which is a crank. Through these cranks a vibratory motion is given to the back end of the charging bar through the medium of connecting rods between the cranks and pins on the sides of the cab. On the forward end of the carriage is a motor for moving it in and out of the furnace This motor is geared by a single reduction direct to the forward axle. In addition to the small motor mentioned above, for the rotating motion, there is a 25-h. p. motor for each of the three other motions—main traverse, lifting gearing and trolley traverse. These are all of the street railway type. The motors and gearing of the charging machine easily handle a charging box weighing with its contents 6,000 pounds. The machine moves on a track in front of the furnace a train of three charging buggies each loaded with three full boxes.

The charging cars are brought to the furnace end of the steel foundry from the yard, up a 20-degree incline, which is shown in Fig. 1. The cars are pushed to the foot of the incline by the yard engine. The conveying equipment which takes them up the incline consists of an endless chain, passing over two sprocket wheels, one in a pit at the foot of the incline and the other between the tracks beneath the charging platform. The links are of a Jeffrey pattern and are provided at intervals with rollers, the chain traversing a well lubricated channel in the center of the incline tracks and returning in a steel channel placed underground. Along the chain at intervals equal to the distance between the two axles of a car are special links with grooved faces which engage the axle. A 35-h. p. electric motor of street car type furnishes power, being connected with the sprocket beneath the charging platform.

The improvements and extensions noted more than double the capacity of the foundry, and the present year has been the best in the history of this department of the works. Steel castings up to 60,000 pounds can be made. Orders on hand include considerable gear and other heavy work. Some riveter castings are conspicuous among the work now being turned. Two of these, which are for a monster hydraulic riveter to go to Pittsburg, weigh 40,000 pounds each.

FIG. 3.—INTERIOR VIEW OF OTIS STEEL CO'S ENLARGED FOUNDRY.

MR. ULKE ON "SEMI-STEEL".

TO THE EDITOR:

In reply to Richard Moldenke's interesting remarks entitled "Semi-Steel(?)and Testing Cast Iron," referring to the writer's article in your issue of Dec. 1, on "Making of Gun Iron and Semi-Steel," which appeared in your issue of the 8th inst., let me say that I fail to see why Dr. Moldenke should be so wrought up on account of the use of the term "semi-steel." This term, while not claimed to be strictly defined, is commonly used among many engineers and foundrymen of wide experience, and is recognized as a legitimate term in the Patent Office and other scientific records. There is, therefore, but little reason why the writer should not use this term to designate a well-known commercial product, even if the latter has not been defined with exactitude.

A second statement made by Dr. Moldenke, that the cutting of samples from normal castings which vary in thickness "gives test specimens which result in figures so hopelessly discordant that one is all at sea," certainly does not tally with the general experience of those whose special business it is to inspect and test. Nor has the writer found that "attaching the test specimen (coupon) to the casting itself" is "a thing which every founder knows is accompanied by so many circumstances affecting the results that proper representation is hopeless." Tests from coupons properly placed on the casting and of the size designated by the U. S. Inspectors and in the Government specifications referred to give sufficiently concordant results for practically all ordinary purposes.

In conclusion, Dr. Moldenke virtually condemns the methods of testing advocated by the writer and others, because "the bars are machined before testing," claiming that the casting is thereby relieved of its strain to a considerable extent, so that the results are "up to 15 per cent higher than the iron can stand in service." This point again is not well taken, in the writer's opinion, because the castings referred to are also machined before they are subjected to service stresses in the gun and mortar carriages in which they are used

Taking all the above facts into consideration, therefore, the writer again voices his belief, that the day of the general adoption of standard Government specifications and the methods of testing advocated, based as they are on thorough, practical studies of the conditions encountered, is rapidly approaching, notwithstanding the pessimistic views entertained in this regard by Dr. Richard Moldenke. TITUS ULKE.

Columbus, O., Dec. 10.

PIG IRON FOR GUN CARRIAGE WORK.

TO THE EDITOR:

We note, in your paper of Dec. 1, quite a long article on gun iron and semi-steel metal for gun carriage work. During the last two or three years we have furnished, so far as we know, nearly all of the metal for this class of work, holding the arsenal trade at Watertown and other points almost exclusively, and the large producers such as Bethlehem Iron Co., R. Poole Sons Co., Niles Tool Works Co., American Hoist & Derrick Co., Builders Iron Foundry, Cramp Ship Yards. In fact, about all this trade has used our Salisbury Carbonate iron for this work. We see in your statement of the Niles Tool Works Co. you use, or they gave you, the name "Landon." This represents one of our furnaces, and was sent probably from that furnace. But there are three furnaces under the control of this company, all making this class of metal, and the brand is Carbonate for this class of work. We hand you herewith a circular which will demonstrate it a little more clearly and show you some tests made at Watertown Arsenal at the time this was printed. We also hand you a copy of a letter just received from one of our customers who used the iron just as we directed, and as you will see, these tests were made direct from a cupola casting, not air furnace. We guarantee always that this class of metal will pass the Government tests if properly handled and melted with good Connellsville coke, and we believe that at the price, it is much cheaper for the consumers than to attempt to mix with a variety of metals in order to try to get a cheaper metal and thereby risk losing many castings. So far as we know there has never been a casting lost from any defect in the metal or the tensile strength, when this iron is used alone and with a mixture of good gun scrap. We only call your attention to this to put ourselves on record and avoid errors that may occur in the minds of the people about the use of these different metals.

J. J. MOREHOUSE,
President Salisbury Carbonate Iron Co.

New York, Dec. 8.

[The letter referred to above is from the Lake Erie Engineering Works, Buffalo, N. Y., under date of Nov. 19, 1898. It gave the results of heats in which Salisbury Carbonate, of which two cars had been ordered for trial, was used for gun castings. But one experimental heat was made, and that was the first. In this just the metal required was secured. Supt. P. H. Kane, who writes the letter, gives the following details of various heats:

First heat Oct. 7, 1898. High grade Salisbury Carbonate Iron.

		Tensile strength.
½ Salisbury Carbonate Iron,	No. 4	35,560 lbs.
½ " " "	No. 4 high,	

Second heat Oct. 15, 1898. Castings in weight from 500 to 18,000 lbs.

½ Salisbury Carbonate Iron,	No. 4,	34,850 lbs.
½ " " "	No. 4, high,	

Third heat Oct. 21, 1898. Castings as above.

½ Salisbury Carbonate,	No. 4,	35,320 lbs.
½ " "	No. 4 high,	

Fourth heat Oct. 29, 1898. Castings as above.

50 per cent Salisbury Carbonate	No. 4,	34,800 lbs.
30 " " "	No. 4 high,	
20 " " "	Scrap,	

Fifth heat Nov. 2, 1898. Castings as above.

50 per cent Salisbury Carbonate,	No. 4,	33,840 lbs.
30 " " "	No. 4 high	
20 " " "	Scrap,	

Western Foundrymen's Association.

The next meeting of the Western Foundrymen's Association will be held at the Great Northern Hotel, Chicago, Wednesday, Dec. 21, 1898, at 7:30 P. M. A paper by Max. H. Wcikhorst, engineer of tests, C., B. & Q. R. R. Co., Aurora, Ill., entitled "Porous Castings and Occluded Gases," will be read and discussed. The following topical questions will come up for discussion, in their order:

What is your experience in regard to sand burning on castings so hard it must be chipped off? What causes it, and what can be done to prevent it?

What has been your experience in using core compounds?

What can be said for or against the regular use of softeners in a mixture containing a very high scrap percentage?

In disposing of burnt iron profitably, how would you do it other than casting into sash weights?

What benefit, if any, is derived from adding wrought iron and steel scrap to mixtures for malleable castings? Are such additions discoverable in a proportionate increase in weight of castings? In other words, do you get out what you put in the cupola?

The secretary asks that members send in written discussions of these questions to be read at the meeting, if unable to be present. Foundrymen are requested to send in questions relating to foundry practice, or reports of any experience or phenomena, which they may desire discussed, to the secretary, B. M. Gardner, 1522 Monadnock Block, Chicago.

FIG. 4.—OTIS STEEL CO'S FOUNDRY—CLEANING ROOM.

NOTE ON STRENGTH OF WHEEL RIMS. *

BY ALBERT K. MANSFIELD, SALEM, O.

On page 5 of Mr. Supplee's translation of Reuleaux's "Constructeur" occur these words: "It is upon this point that the peculiar strengthening effect of ribs depends, and which makes their use so advantageous in cast iron construction." Then illustrations follow to support the fact that ribbed construction increases strength, that is, is economical of material; but it is not shown there, nor elsewhere to the present writer's knowledge, that this is not universally the case, but that the exact contrary may be the fact. This may best be pointed out by a practical illustration:

The moment of resistance of the rectangular section of Fig. 1 is $\frac{bh^2}{6}$ or $\frac{26\times 2\frac{1}{2}^3}{6} = 27.07$, AA being the neutral axis.

Now let one-fourth inch of the thickness of this section be formed into a rib 3¼ inches thick, as shown by Fig. 2. Preserving the same total area as before, this rib becomes 2 inches deep, making the total depth of the section 4¼ inches. The neutral axis will be found to be located as shown in the figure, and from a well-known formula the moment of resistance is found to be 18.64; that is, the least moment of resistance, or the moment of inertia divided by the greatest distance of fibre from the neutral axis.

The section has therefore been weakened by the ribs; in fact, unless it represents the special case of a cast-iron beam loaded so that the extreme fibre is subjected to compression, it is only about two-thirds as strong as before. It is seen, therefore, that under some conditions ribbing does not have a strengthening effect. It would clearly be useful to generalize this matter in such a way as to make it easy for the designer to determine when and to what extent ribbing may or may not be resorted to with advantage, but that is beyond the purpose of the present writing.

If we separate the rib of Fig. 2 into two ribs and place them at the ends of the section as in Fig. 3, we have, without change of strength, a section similar to that often used in the construction of wheel rims. The bending moment of such rims, due to centrifugal force, acts with maximum effect near the wheel arms, in such a way as to cause tension at the extreme fibre. It will be clear, therefore, that such ribs in such place may make the wheel weaker than it would be if they were not employed. It is not meant that wheels cannot be ribbed in this manner to their advantage, but rather that it is necessary to take care that they are not thus ribbed to their disadvantage. There are many wheels in service which have been strengthened in this negative way.

The destructive accidents which have occurred to large wheels have led to bringing cast iron into disrepute as a material from which to construct such wheels. This fact, coupled with that pointed out above relative to rim-flanges, has led the present writer to the use of the method of ribbing wheels illustrated in Fig. 4, which seems to fill all requirements enabling cast iron rims to be made as strong as may be practically desired.

Maintaining the same face of wheel and total area of section as before, let us employ ¾ inch of the thickness of rim in forming a rib 1¾ inches thick at centre of rim; the section then becomes as shown by Fig. 5. The neutral axis of this section is at line A A, and the moment of resistance becomes 77.5, which is nearly three times as strong as the section of Fig. 1, and more than four times as strong as the flanged section of Fig. 3. Of course, a further increase of strength may be obtained by adding to depth of flange.

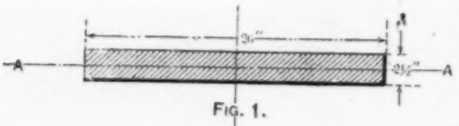


FIG. 1.

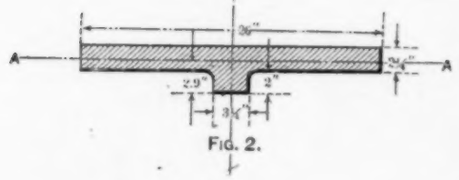


FIG. 2.

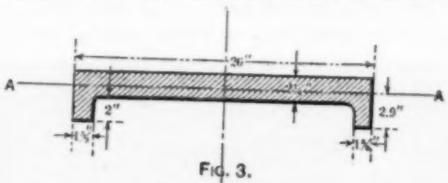


FIG. 3.

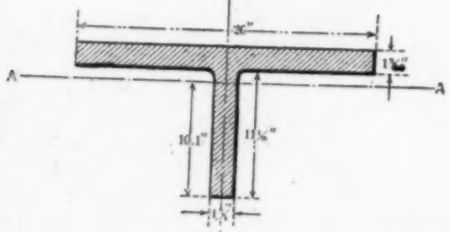


FIG. 5.

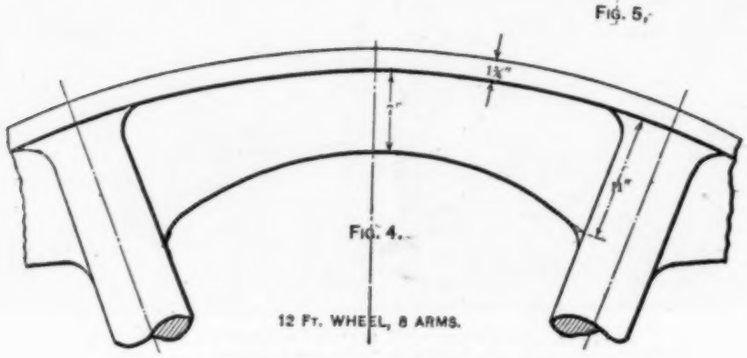


FIG. 4.

12 FT. WHEEL, 8 ARMS.

NOTE ON STRENGTH OF WHEEL RIMS.

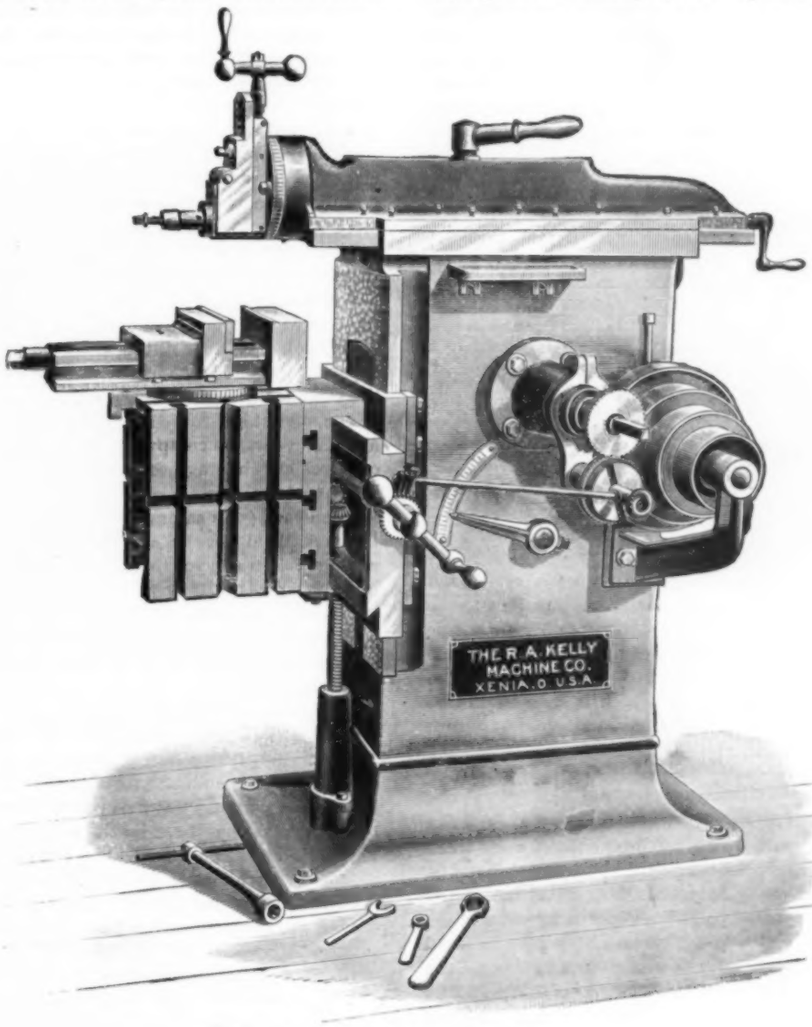
Now the section of Fig. 5 is taken to represent that next the arms, in which (the case being that of a built-in beam uniformly loaded) the extreme fibre is under tension. The mid-section between arms, however, while acted upon by an equal moment (when the cross-section is uniform), is bent in an opposite direction; therefore the extreme filler is compressed, which, for equal strength, enables the flange at this point to be reduced, because cast iron is twice as able to resist compression as extension. The modulus of resistance at this point may therefore be one-half as great as at the arms, which will be found to correspond with a flange depth of about five-eighths of that at arms, or in this case about 7 inches. These proportions are shown in Fig. 4. Almost any desired strength may be attained by this method. It has several other advantages over uniform flanges at edges which will readily occur to designers of wheels.

* Read at the New York meeting of the American Society of Mechanical Engineers.

The Ramapo Wheel & Foundry Co. is offering its car wheel and foundry plant, located at Ramapo, N. Y., for lease, and the machinery, tools, fixtures and stock for sale.

TWENTY-INCH CRANK SHAPER.

In addition to its improved 15- and 16-inch pillar or crank shapers, the R. A. Kelly Machine Co., Xenia, O., has put on the market a 20-inch crank shaper, constructed for the special purpose of planing small parts of machinery and tools of various shapes which cannot, with economy, be worked on a slow running planer and yet require to be accurate. The ram has a long bearing surface even if put to its full stroke, and will not spring or give under heavy cuts. The table, which is of the box pattern, has horizontal T slots on the left-hand side of the machine for bolting to the table different classes of work which cannot be held in the vise. The right-hand side has besides two vertical T slots, with a V-shaped groove in the centre, enabling the operator to bolt a shaft or any other cylindrical piece of work to be planed while held in upright position. A slot is planed horizontally on the same side to put on the vise. The table can be detached from the machine and the work bolted direct to the apron, a desirable feature



TWENTY-INCH CRANK SHAPER.

where heavy pieces have to be planed. The cross-rail or cross-head is made long so as to give the table sufficient travel. The apron has a dovetail slide on the bottom where it is connected with the cross rail. The cross-feed is positive, and easy in operation, having a perfect feed-block. A change of stroke can be made while the machine is in operation.

A patented crank motion consists of a rack and wrist, which is made of the best cast steel, sliding on the surface of a perfect cut gear and changed from the outside alike in 15-, 16- and 20-inch machines. Locking gives it the firmness of one piece. In the construction of this tool, the crank which transfers motion to the rocker arm has been brought as high as possible, giving the largest power to the ram while taking cut.

This type of shapers has a wide base, giving correspondingly greater space between the bolt holes and thus greater rigidity. At the same time they are reinforced on the back to secure greater strength.

POINTS IN SHOP AND FOUNDRY PRACTICE.

A summation of the discussion of the topical questions propounded at the recent meeting of the American Society of Mechanical Engineers, at New York, is given as follows in the *Engineering News:*

Does it pay to pickle ordinary castings? The replies were to the effect that it depends on the kind of castings. It rarely pays to pickle a heavy casting, but small pieces, such as hardware castings, may be pickeled to advantage. The use of hydrofluoric acid as a very effective pickle was mentioned, and the sand blast was commended as far superior to pickling.

Has any improvement in foundry practice been observed from the recent investigations into the physics of cast iron? No one had any reply to make to this question. What is the strength of pipe fittings made by a casting process? It was explained that this query arose from trouble experienced by exporters of pipe and pipe fittings to foreign markets. The fittings in this country are usually of cast iron, and they are objected to by foreign purchasers, since the foreign practice is to make them of wrought iron. No definite answer was given to the query, but it was stated that cast iron fittings are strong enough for all purposes except that of withstanding water ram in large pipes, and that no fitting will resist.

What constitutes a seamless tube? This question arose from some makers of a tube which is not seamless giving their product the name "seamless." A seamless tube was defined as one which had no line of union, and which never had two portions or edges brought together which were at any time separated since the metal was an ingot. A tube made by cupping and drawing from a sheet, or drawn from an ingot which had a hole cast or bored in it was properly called seamless.

On how small a tool does it pay to put an individual electric motor? The question being taken to relate to machine shop tools, it was replied that it generally does not pay to have any

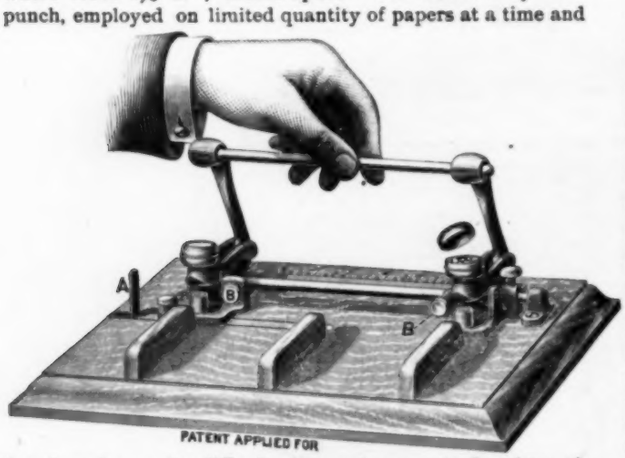
electric motor in the shop of less than 5½ h.p. Smaller units are apt to give trouble, as they are too delicate an instrument for an ordinary shop. The best plan for small tools is to drive the line shafts by motors, and belts from these shafts to the tools.

Have you any new notions on machine shop floors? Several members discussed this question, not claiming to have "new notions," but relating their experience with floors of various kinds. Spruce floors 3 inches thick, overlaid with 1¼ inches of hard rock maple, were commended as being about the most durable floor that can be made.

Is it of real advantage to submerge the smoke-box of an upright boiler, to prevent expansion of the tubes? No answer was made to this question.

REGISTERING ORDER PUNCH.

A punch to punch two holes at once, either in order sheets or correspondence, and forms of all sorts for which post binders are used, has been brought out by the Samuel C. Tatum Co., of Cincinnati. It consists of two levers, which are coupled together so as to punch the two holes at once. The special feature is in the adjustability of the distances between the holes. In the machine illustrated, this may be varied anywhere from 1¾ to 7 inches apart. With an ordinary hand punch, employed on limited quantity of papers at a time and



therefore slower, the difficulty is to get any sort of register of distances, either from the margin or from one hole to the other. The device illustrated provides not only for a side gauge, but also for a throat or margin gauge, so that the distance from the margin can be exactly maintained. The two cups set over the centre, one of which is shown with the lid removed, catch all of the perforations, and avoid any litter in using the punch.

Connellsville Coke Output.

The production of coke in the Connellsville region last week was stationary as compared with the production for the week previous, and the same condition existed in the shipments. Figures for the latter would have been larger had the supply of cars been adequate at all points. There is some shortage of stocks in the West and several cities would have on hand at present larger supplies for the winter could they get the coke in, which is only possible under difficulties in the face of the car famine. The production of coke for the month of November was larger than for any other month of the year, having been 626,301 tons, the next largest month in the year having been March, when the production was only a few thousand tons short of that of November. At this rate of production the Connellsville region's output for the year will be 7,515,000 tons.

The detailed report of the operation and output of the Connellsville region for the week ending Saturday, Dec. 3, shows 18,463 ovens, of which 14,880 are active and 3,583 are idle, the estimated production for the week having been 154,866 tons, as compared with 154,574 tons the week previous, a slight gain. The shipments last week aggregated 8,923 cars, distributed as follows: To Pittsburg and river tipples, 2,911 cars; to points west of Pittsburg, 4,552 cars; to points east of Connellsville, 1,460 cars. This is a decrease of 68 cars as compared with the shipments for the week previous.—[Connellsville Courier.

THE STEEL CAR GAINING GROUND.

It is only about a year and a half since the all-steel freight car, as heretofore illustrated in the columns of *The Iron Trade Review*, assumed commercial importance; yet in that brief space 3,600 such cars have been turned out by the Schoen Pressed Steel Co., and this closely represents the production of all-steel freight cars. To make these cars nearly 45,000 tons of plates have been required, since it requires on an average about 25,000 pounds of plates for a car. A very considerable part of this is unavoidable waste in cutting and is sold as scrap. Unlike most machines—and a freight car is a machine—the less weight there is in a steel car for the capacity the better, and the present designs therefore take into account every saving possible. In the underframing, which supports the floor, the Schoen sills are of steel plate, pressed to a channel section, but the depth tapers to the ends, saving about a thousand pounds per car as compared with a similar construction employing rolled sections.

It must not be supposed that the sudden introduction of steel freight cars has come without effort. Railroad managers have really been very slow and conservative in its adoption. The advocates of this construction worked for years, gradually evolving one part after another, which was tried commercially in car construction, until finally the whole car is built of steel, and even then cars must be sold at such low prices, considering the cost of manufacture and their economic efficiency as compared with wooden cars, that the railroads can readily figure an immense saving from their adoption. The steel cars are all based on a carrying capacity of 100,000 pounds. Their weight varies from 26,500 pounds to 34,000 pounds, according to the bulk of the material to be carried. The average cost of these steel cars is practically the same as the cost of wooden cars of good construction to carry the same load, i. e., a steel freight car of 100,000 pounds carrying capacity costs as much as the wooden cars which could carry the same load.

The advantage of the steel car then lies (1) in its life being about 40 years, as compared with 15 years for the wooden car (iron cars having been in use in France for 60 years); (2) in a cost for repairs of say $20 a year against $40 for the wooden car; (3) a saving in dead weight for the steel car of fully one-third, for the same live load; (4) shorter and more manageable trains for the same paying load. Without going into the figures, it may be said that it can be readily calculated that a steel car will save about $82 a year, as compared with wooden cars, which means a saving for 500 steel cars, lasting only 30 years, of $1,230,000. This is simply in cost and maintenance of cars. The saving in dead weight carried can be shown to be somewhat greater than this even. Considering these facts, the adoption of the steel freight car is by no means surprising, and it should be remarked further that it would have been much slower were it not that the price of the steel cars has been very low. On every large order for these cars that has been let there has been the closest figuring by bidders; and while one company has had almost a monopoly of the work, this has been due to its having made a special study of the subject, which permits of building cars having the lowest possible dead weight consistent with the required strength, and to the large capital invested, which permits of the most economical methods of production.

The plates used run from three-eighths inch thickness down. The plates are of mild open-hearth steel, and are ordered to rectangular sizes. The orders are distributed among practically all the plate makers in and near the Pittsburg district, the largest sizes going to the large producers and the smaller sizes to smaller plate mills which cannot turn out the large sizes.

The present plant of the Schoen Pressed Steel Co., which is located in Lower Allegheny, has a capacity for turning out 20 complete cars a day. Additions are being made to the plant which will give it a capacity of 30 cars a day. The plans are practically completed for an entirely new plant, to have a capacity of 45 cars a day. This plant will be located at the best point on the Monongahela river to save freight rates and reduce the cost of production. The Allegheny plant will be kept in operation, the two plants having, therefore, a capacity of 75 freight cars a day. The company now has orders booked to keep it busy until next May. It is expected that the new plant can be built in a comparatively short time, for all the details will be based upon actual experience, which has been gained at great cost, as is the case with any new industry.

INTERNATIONAL TRADE IN IRON AND STEEL.

A very remarkable document has recently been issued by the German Iron Trade Association. It is a statement of the imports and exports of iron and steel for 72 different countries, including 21 in Europe, 20 in America, nine in China, nine on the Australasian Continent, seven in Africa, and five in the German colonial possessions. These figures furnish an approximate idea of the extent and variety of the markets that are open, and are being opened, for the supply of iron and steel. A great many of these markets are almost entirely new, or were so within a very recent period. In this category we may include nearly the whole of the American markets except the United States and Canada, for the quantities of iron and steel supplied to the South and Central American States prior to the development of the railway system were of very small account. It has been much the same with the markets of Asia, save only British India, but to our great Indian Dependency we have within recent years had to add Persia, Siam, the Dutch East Indies, the Philippine Islands, China and Japan, all of which promise to be extensive markets in the near future. Our own possessions on the Australasian Continent embrace Victoria, New South Wales, Queensland, Tasmania, Western Australia, South Australia, and New Zealand, in addition to the Fiji Islands and New Caledonia. Africa, again, provides the comparatively new markets of the Cape, the Transvaal, Egypt, Tunis, Tripoli, Morocco, and the Congo, and the new field of the Soudan has been guaranteed by Lord Kitchener, and by others who know something of its character and resources, to open up a wide extent of territory and trade.

One of the most remarkable features of the world's export trade in iron and steel is the much larger amount of business carried on inter se among iron-making countries, than between these same countries and fields that are only slightly developed, although wholly dependent on outside supplies. Germany, for example, takes more pig iron from Great Britain than any other country, and Great Britain takes more finished iron and steel from Germany than any other country except Russia and Switzerland. The curious thing is that, except Russia, Great Britain now imports larger quantities of finished iron and steel than any other country receiving from other countries of these products more than twice as much as Germany or the United States, while we take more than three times as much as France, and four times as much as Austria-Hungary. The table herewith shows the imports of different descriptions of iron and steel into the eight leading iron-producing countries of the world in 1897.

So far as British imports of iron and steel are concerned, it is well known that the leading items are bars for the crucible steel industry, wire, girders, tubes for the cycle industry, etc., while of the imports into the United States more than one half takes the form of tin plates, the other chief items including pig iron, billets and blooms—mostly crucible—and bar iron, and wire rods of special descriptions. Germany chiefly imports, in addition to pig iron, bars, sheets and plates, tin plates, wire and castings.—[London Iron and Coal Trades Review.

IMPORTS OF IRON AND STEEL INTO DIFFERENT COUNTRIES (1=1,000 TONS).

	Pig and Old Iron.	Finished Iron and Steel.
Great Britain,	40	368
Germany,	461	173
United States,	22	135
France,	125	113
Austria-Hungary,	165	85
Sweden,	54	—
Russia,	102	503
Belgium,	364	99

TRIPLE PUNCHING MACHINE.

The accompanying illustrations are front and rear views of a new triple punch recently built by the Wais & Roos Punch & Shear Co., of Cincinnati, for the Jeffrey Mfg. Co., of Columbus, O. It presents many features in construction which are both new and valuable. To perform several distinctly different operations on one machine of usual type requires at least a change of tools and blocks, in addition to time, and then the stroke may be well suited for one operation and not be at all adapted to the others. To have a separate machine for each duty involves considerable expense, floor space, power, and extra handling of materials. The triple arrangement represents a minimum on all these points. For the purpose intended the equipment of tools shown consists of two sets of punches of different sizes and one set of shears, but these can be varied to suit other needs.

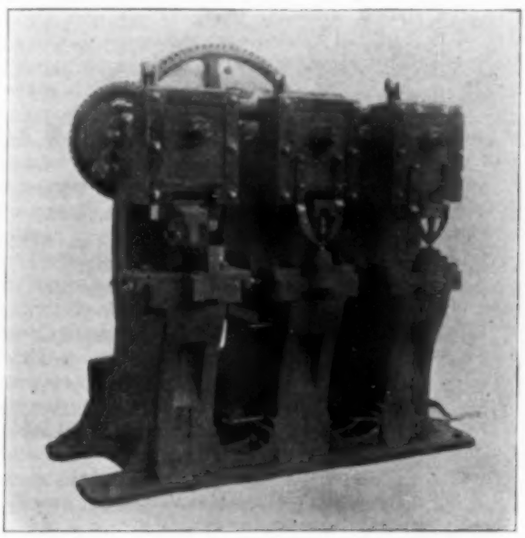


FIG. 1.—FRONT VIEW.

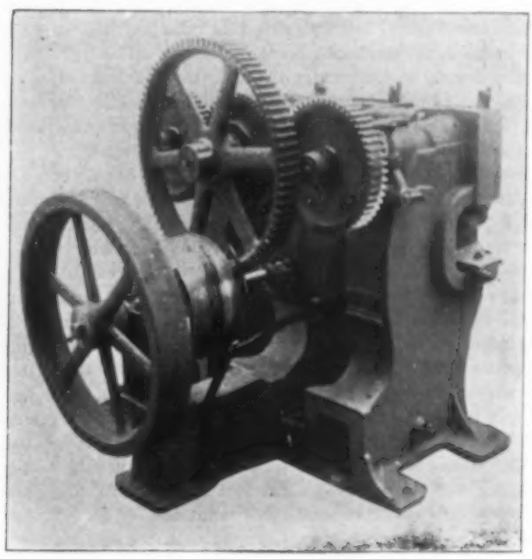


FIG. 2.—BACK VIEW.

TRIPLE PUNCHING MACHINE.

In general construction the machines are of modern type, having best hammered steel shafts adjustable bronze wedges for taking up the wear on the slides, each housing having its own clutch and treadle and hence independent of its neighbor. The outer machines are driven by means of cut gears from the main shaft of the central machine and the latter carries also the large gear, pinion, pulleys, and fly wheel. The advantages gained are economy of space, saving of power, convenience and variety of work accomplished. The manufacturers, the Wais & Roos Punch & Shear Co., are very busy in all departments, with orders which will carry them well into the new year.

A meeting of stockholders and creditors of the Birmingham Rolling Mill Co. was held at Louisville, Ky., Dec. 6. It was decided to reorganize the company and a committee of three was appointed to decide upon a plan.

COMMERCIAL EDUCATION IN THE UNITED STATES.

The rapid growth in American exports of manufactured goods during the past four years has made plainly evident the need of specially trained men to conduct our export business in foreign countries, and especially in those regions of Asia, Africa and South America, for whose trade all civilized nations are in keen competition. It is true that we are rapidly increasing our exports of manufactured goods in many lines; but we are doing it largely by virtue of superior facilities for production, which enable us to undersell our rivals When it is a question of working up new trade, however, or meeting our competitors upon even terms as regards price and quality, it is generally admitted that our salesmen in foreign countries cannot compare with the Germans in point of efficiency. Germany has led all other nations in the establishment of schools designed especially to train those who are to follow commercial life.

In the United States, it was not until 1881 that any of our institutions of learning recognized the need of any such special training. In that year the University of Pennsylvania opened a department known as the Wharton School of Finance and Economy, with a four-year course and a curriculum embracing public law and politics in this and other countries; mercantile law and practice, including accounting; history economics and social science, including banking and currency and the revenue systems of governments, etc. The University of Chicago and the University of California also have separate departments of this sort recently established; while Harvard, Yale, Columbia and a number of other prominent universities offer special courses to students which cover this field.

For a higher education in this direction these schools are doubtless doing good work; but they aim too high for the average young business man, and do not reach the same number or class of individuals as are served by somewhat similar European institutions. The phenomenal trade expansion of Germany is the direct outcome of her system of technical education. She has sent out men carefully trained to study the resources and wants of other nations; and by thoroughly equipped technical and commercial schools, she has fitted those who carry on her manufactures and commerce how best to supply these wants. The advantage possessed by a graduate of one of the German commercial schools are very evident when we consider that he is required to conduct an "office correspondence" in German, French and English, and must be able to converse in one other language, either Spanish, Italian or Dutch; he must be familiar with the geography of foreign countries, their history and commercial conditions and customs; and at the school well filled museums make him familiar with the animal, vegetable and mineral products of other lands. When such a man goes abroad to take a place in the foreign house of a German exporter, he is able to almost at once begin the work of forming acquaintance and business connections, whereas the average graduate of an American high school or college, having at best only a smattering of any other language than his own, and ignorant of the machinery of commerce, finds that he has everything to learn, and that learning under such circumstances is a very difficult task.

That a knowledge of the conditions to be met in foreign markets is of value to those at home as well as those abroad, is shown in the November issue of "Consular Reports." In that issue we find four American consuls criticising American trade methods, due purely to ignorance or to disregard of the directions of foreign importers. The chief complaint is that of bad packing, and the non-observance of foreign customs law. Few of our shippers seem to know that in some countries duties are levied on the gross weight and determined upon the highest-priced article within the package; and a single gold watch packed in a box of cheap cotton prints would result in the computation of the duty as if the case contained only gold watches. The bad condition of American cotton bales, received at Liverpool, occasioned a loss of $500,000 to exporters last season. The Egyptian and East Indian cotton bales are much more compressed, have a stronger and better covering than those coming from the United States, and always arrive in almost perfect condition. A failure to observe the explicit directions of importers, as to dimensions and methods of packing, or to consider the customs and superstitions of possible consumers also stand in our way, and damage the sale of otherwise excellent goods. In China, a fanciful Chinese dragon, as a trademark, will sell goods better than if the housemark were used; in Russia, German makers took away from English firms a considerable trade in handkerchiefs for the head, simply by making them of the peculiar dimensions which the people preferred. Peculiar patterns and colors of calico prints, to suit the fancies of special races, and special forms of tools for farmers or artisans are often necessary to secure the trade of a particular section.

In other words, if we propose to extend our commerce, there is very much to be learned.

Some American manufacturers have already been shrewd enough to appreciate these facts. In Nicaragua, we are told that practically all the machetes used are made by Collins, of Hartford, Conn., who has produced a blade of exactly the shape the natives desire, and as a consequence they will not buy a machete unless "Collins" is stamped on the blade.

It thus appears that if we are to compete for the world's trade in all lines, and not merely those in which our wealth of natural resources gives us a large advantage, there is much to be learned both by our manufacturers at home and by their agents sent abroad. To obtain this knowledge we must make a beginning, at least, in what may be called popular commercial education. The models exist in European institutions of a similar character, though these would doubtless have to be modified to suit our conditions. In this connection, it is an encouraging indication of the appreciation of the need of such training to note that a committee of the New York Chamber of Commerce was recently appointed to prepare and submit a plan for the establishment and development of better commercial education in our secondary and higher schools. England has been forced to similar action, because German and other foreign clerks, on account of their superior commercial training and ability, were rapidly supplanting young Englishmen in positions of trust. The London Chamber of Commerce now grants commercial certificates to candidates who produce evidence of proficiency, according to certain prescribed branches of study, including, at least, two languages, and elementary drawing, chemistry and physics. The Paris Chamber of Commerce manages the Paris Commercial High School; and exemption from military service, for more than one year, is an inducement held out to attend this school. The action of the New York Chamber of Commerce is timely, and it is to be hoped that good results will follow its recommendations.—[Engineering News.

New Gun Works at Newport News.

C. P. Huntington, principal stockholder in the Newport News Shipbuilding & Dry Dock Co., has given out a statement concerning the reports in circulation for some time past to the effect that the English firm of Vickers, Sons & Maxim has been negotiating for an interest in the Newport News plant: "I have been in negotiation with the Messrs. Vickers, Sons & Maxim, who have thought of taking a large interest in the plant and of establishing at Newport News, in connection with the ship yard, a very extensive plant for the manufacture of guns. If these negotiations should be carried to a conclusion, there would be established at Newport News a new and important industry. But the yard would continue to be an American enterprise, as I do not propose to sell my holdings outright, but to retain a large interest. I would like, however, to lessen my cares and responsibilities, and let others take up and carry on the work that I have started. Mr. Crosley, Mr. Dunn and Mr. Loewe came over from England to look about, and while here examined my ship yard most thoroughly. I learned that they expressed themselves as very much pleased with it. The proposed gun plant would not be a separate organization. It would be conducted as a part of the general business. I have wanted to get those people to take a large interest, because I was anxious to see a great gun manufacturing establishment put up at Newport News, and my impression is that my English friends will find it very greatly to their interest to complete the negotiations. I think, too, that it will be a good thing for our government. The Vickers, Sons & Maxim are known over the whole world for their skill and success in making great ships and all sizes of guns. Their experience would be invaluable at Newport News, and they would find there advantages which I do not believe can be had anywhere else to the same extent."

FOUNDRYMEN'S ASSOCIATION.

The regular monthly meeting of the Foundrymen's Association was held at the Manufacturers' Club, Philadelphia, on Wednesday evening, Dec. 7th, with President P. D. Wanner, of the Reading Foundry Co., in the chair. The following were among those present:

P. D. Wanner, Reading Foundry Co., Reading, Pa ; Frank W. Thatcher, Florence Iron Works, Florence, N. J.; C. L. Prince, C. L. Newcomb, C. D. Mathews, Camden Iron Works, Camden, N. J.; I. Snowden Haines, Samuel Bentley, McNeal Pipe & Foundry Co., Burlington, N. J.; Philip C. Smith, Ingersol-Sergeant Drill Co., Easton, Pa.; Chas. Taylor, Pettinos Bros., Bethlehem, Pa.; Geo. A. Schreiner, Samuel H. Fisher, Harrisburg Foundry & Machine Co., Harrisburg, Pa.; Geo. C. Davies, Pilling & Crane; M. F. Carr, J. H. Julian, J. W. Paxson Co.; Geo. W. Moore, S. G. Flagg & Co.; A. W. Goodell, Goodell & Waters; Thos. I. Rankin, Abram Cox Stove Co.; Josiah Thompson, J. Thompson & Co.; Edw. Wood, R. D. Wood & Co.; Jno. J. McCrystal, Fred. Stahle, Girard Iron Co.; Geo. C. Davis, Thos. Devlin & Co.; J. A. Clark, Clark's Iron Foundry; C. R. Baird, C. R. Baird & Co.; I. R. Newkirk, J. B. Newkirk & Co.; Geo. H. Berlin, Jerome, Keeley & Co.; J. S. Hibbs, J. W. Paxson Co.; Edw. Bergen, Bement, Miles & Co.; S. G. Flagg, Sr., S. G. Flagg & Co.—all of Philadelphia; R. H. Palmer, Ferro Carbon Casting Co., Frankford, Philadelphia.

Secretary Evans read the report of the Executive Committee: "Your committee regrets that it is its duty to report the death of Mr. Thomas Glover, of the firm of Glover Bros., Frankford, Philadelphia, on Monday morning, Nov. 28th, of paralysis. Mr. Glover had been identified with the foundry interests in Philadelphia probably longer than any other one man. He engaged with Morris, Tasker & Co., foundry department, in 1856, when he was 14 years of age, and remained with them, barring a year or two, until 1884, when he started in the foundry business with his brother at Frankford, where they have been very prosperous. His age was 56 years. Whenever a discussion took place in this association as to the making of a casting, either in dry sand, green sand or loam, Mr. Glover always took a lively interest and in this way kept himself up to date on foundry practice. He had been a director of this association ever since its formation in 1891.

"Down to five or ten years ago, foundry engineers from the old world were sent to the United States to teach us the ways and means of making perfect and clean castings for the least money, introducing new methods that were better than we had. The tables seem to have been turned now, for the reason that our foundry practice has improved to such an extent that we are ahead of the times. Of late there have been many inquiries for improved appliances and equipment from the other side, as they have appreciated the fact that the cost of American castings is less than theirs, and our manner of making them in advance of their methods. This probably has been brought about by the fact that castings made in this country have been exported to all parts of the world and the eyes of foreigners have been opened to the fact that American foundry practice leads the world."

The secretary cast a single ballot electing to membership in the association John H. Mueller, president of the Henry McShane Mfg. Co., of Baltimore, Md., and John S. Kennedy, manager of the Sheridan Iron Co., of Sheridan, Pa.

The treasurer reported a balance in the treasury of $578.02 in cash, and $1,000 in bonds of the Manufacturers' Club.

Mr. Evans called up for discussion the question whether a foundryman is legally responsible for the destruction upon his premises of patterns belonging to a customer. Mr. A. W. Goodell wanted to know what was the practice among foundrymen as to insuring patterns.

Mr. Thomson cited a personal experience. Upon one occasion his shop was burned down, and the patterns of a customer were consumed. The customer expected him to replace the patterns and go ahead with the order. "We got out of it by allowing the customer to have new patterns made elsewhere at our expense, and the bill we included in the insurance claim."

Mr. Wanner—"As an attorney, I would say in a case like that that the foundryman could not be expected and could not be called upon for more than the exercise of proper care. He surely could not be expected to insure patterns at his own expense."

Mr. Evans—"How would you determine whether or not the foundryman had been duly careful?"

Mr. Wanner—"That would be altogether a question of evidence."

Mr. Goodell—"Is it a custom among the foundrymen to insure the patterns of customers?"

Mr. Wanner—"I never knew of it."

Mr. Wanner—"We've had people insure their patterns in our place, and we have kept the patterns stored on our shelves."

Mr. Evans—"There is a gentleman here to-night who told me that he has had patterns of customers on his shelves that he has been carrying for years and years. If these patterns should be burned, and the owners demand their value of him, he wouldn't be able to make up the loss for years. Now, here's a suppositious case. Suppose you should send your wagon to the wheelwright to be repaired, and the wheelwright's shop should be burned, who would be responsible for the loss of your wagon?"

Mr. Wanner—"That seems to me to be an entirely different case."

Mr. Flagg—"Is it not imperative upon a customer to ascertain beforehand whether the foundryman would insure his patterns?"

Mr. Wanner—"I think so."

Mr. Riehle—"I think it proper for foundrymen to find what customers expect when contracts are made, so that there may be no difficulty later."

Mr. Rankin—"I agree with Mr. Evans that the owner of the patterns should be responsible for their loss. If you should send your horse and carriage to a livery stable to be cared for, and the stable should burn down and your property be destroyed, it would be hardly fair to expect the liveryman to reimburse you."

Mr. Evans—"How would it do to pass a resolution as the sense of this meeting that all foundrymen should make inquiry among their customers as to their view of the matter?"

Mr. Haskins—"I think we should ignore the matter altogether, and certainly refuse to insure patterns."

Mr. Flagg—"I doubt if you could get any underwriter to insure another man's patterns in your shop. It's hard enough to get your own insured."

Mr. Riehle—"I offer as a motion that foundrymen do not hold themselves responsible for customers' patterns destroyed in their shops by fire or water."

This motion, slightly amended, was passed.

Mr. C. L. Prince, of the Camden Iron Works, was introduced. He had prepared a number of lantern slides for the entertainment of the meeting. They consisted mostly of views about the Camden works. "I have prepared no formal paper," said he, "but hope to give you a short talk explaining the different views which will be projected upon the screen." Mr. Prince's brief address was extremely entertaining, and he was tendered a hearty vote of thanks.

On motion of Mr. Riehle, President Wanner appointed Messrs. Thomson, Rankin and Evans a committee to draft resolutions upon the death of Thomas Glover. Shortly thereafter the meeting adjourned.

A New Furnace 105 x 24 Feet.

Laughlin & Co., Ltd., Pittsburg, who manufacture pig iron for Jones & Laughlins, Ltd., will shortly begin the erection of an additional furnace to the Eliza group, out Second ave., Pittsburg. The new furnace will be larger than any now in operation, being 105 feet high and 24 feet in diameter at the bosh, with large stoves and ample blowing capacity. The rated capacity will be 600 tons a day. The three Eliza furnaces are being remodeled, one at a time, to bring them up to this size and capacity. Work on the first has progressed for about three months, and will not be completed until some time early next year. When the remodeling is completed, and the new furnace built, the four Eliza furnaces will have a combined capacity of easily 2,400 tons a day, besides which the company is operating under a lease made some time ago to the Soho furnace, formerly owned by the late Moorhead-McCleane Co.

INDUSTRIAL SUMMARY.

New Buyers in the Market, and Some of Their Wants:—

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

The Law Co., of New York City, has been incorporated to manufacture emery wheels and machinery. Capital, $20,000. Directors: Jesse L. Law, Jr., of 109 Water st., New York, and two others.

E. Harvey has leased the Martin Iron Works, at Fitzgerald, Ga., and will operate a machine shop and foundry.

J. R. Cook & Son, of Oglethorpe, Ga., are about to establish a foundry and machine shop at Americus, Ga.

The Cyclops Iron Works, San Francisco, Cal., capital $50,000, has been incorporated by V. Etionne, J. Etionne and others.

The Eagle Fluor-spar Co., care of T. H. B. Haase, Wheeling, W. Va., is figuring on the erection of a plant for fluor-spar crushing, etc. Will require emery mill, stone mills, crusher, engine, boiler, belting, etc.

The Greer Machinery Co., Knoxville, Tenn., is inquiring prices on second-hand Bradley power hammer, from 50 to 75 pounds.

At Radford, Va., a company has been organized recently and is operating the old stove and foundry works as a plant for general castings for plows and mining purposes. W. T. Baxter is manager.

The Auburn Foundry has been started at Garrett, Ind., under new ownership.

Articles of incorporation have been filed in New York State for the Elmira Mfg. Co., of Elmira The capital stock is $300,000, all subscribed. The objects of the company are to make and sell hydraulic steam and other engines and machinery. The officers are: President, I. D. Booth; vice-president, F. E. Doolittle; secretary, S. C. Estey; treasurer, S. J. Hall, general manager, N. A. Johns; attorney, Chas. M. Marvin. The directors are the above named, with Henry A. Moore, F. Bright, B. M. Masten, C. H. Firman, F. H. Rees, Wilbur Kenzie and J. N. Ward.

The Lorain Wheel Works is the name of a new company composed of Cleveland, Elyria and Lorain, O., capital, organized to manufacture bicycles. The plant of the old Lorain brass works will be occupied. H. J. Williams, of the Fay Mfg. Co., is prominent in the new enterprise.

At Akron, O., a bicycle factory has been located through the efforts of F. M. Atterholt and the board of trade. It will occupy the old Empire mower and reaper works.

The Liquid Pressed Casting Co. has been incorporated at Chicago, with a capital stock of $60,000, to make metal castings, by Frank G. Howser, Thos. B. McGregor and R. L. Terry.

The Standard Boiler Co., Goshen, Ind., started up under a reorganization on Dec. 5, with several good orders on hand. S. K. Gregg is vice-president, J. H. Gregg secretary and W. L. Stonex, treasurer. A Chicago capitalist is to be made president.

The new Stevens agricultural machinery plant, moved to Marinette, Wis., from Auburn, N. Y., has started up in the foundry department. It is expected that 200 men will soon be at work.

The new malleable iron plant at Albion, Mich., started up last week.

New Construction:—

Plans are being made for new shops for the Colorado Midland, to replace those burned at Colorado City.

The Schoen Pressed Steel Co., Pittsburg, has taken out a building permit in Allegheny for a one-story steel building, 102x390 feet, to cost $15,000, and to be used as a shop for painting cars in connection with its steel freight car works on Preble ave., Allegheny.

The Birmingham (Ala.) Machine & Foundry Co. is preparing to erect a new foundry. It will be 100x200 feet, of iron and steel, and contract has been let; traveling cranes and complete modern foundry equipment will be installed.

At Indiana, G. C. Harwood and C. G. Barley have formed a partnership for the manufacture of iron and brass bedsteads.

The Gillette-Herzog Mfg. Co., Minneapolis, Minn., is pushing the addition to the plant of the Minneapolis Rolling Mill Co., Minneapolis, and expects to have it completed and ready for the production of steel in January. The latter company has manufactured over 10,000 tons of bar iron in the 10 months it has been running, and with the addition of the open-hearth furnace plant it expects to turn out 20,000 tons of iron and steel next year.

The Berlin Iron Bridge Co., of East Berlin, Conn., recently built for Newport, Herkimer County, N. Y., a bridge having two spans of about 70 feet each. This bridge is of the parabolic type, with steel floor beams and stringers.

The Southern Pacific is rebuilding its shops at Sacramento, which were partly destroyed by fire. The company is now putting up a two-story building, 71 x 186 feet, the lower story of which is to be used as a car machine shop. Both will be of brick, with iron roof trusses and corrugated galvanized iron covering.

The roof of the Randolph & Clowes brass and copper rolling mill, Waterbury, Conn., was caved in by a recent storm. Temporary roofs have been erected over the machinery and the plant is expected to be in running order this week.

The Pittsburg Bridge Co. has been doing a large business the past year. The larger contracts now on hand include: Library and assembly rooms for Leland Stanford, Jr., University, Cal.; Forest Street bridge and viaduct, St. Paul, Minn., 235 feet long; boiler house and engine room, Evansville, Ind., water works; parochial school, Pittsfield, Mass.; three buildings for the Brandon Italian Marble Co., Middlebury, Vt.; 700 tons of structural material, Mexican Central Ry.; Bruekner roaster building, Pueblo Smelting & Refining Co.; trolley railway bridges over the Youghiogheny River, at Connersville, Pa., and shaker at Lewiston, Idaho.

The Birmingham (Ala.) Machine & Foundry Co. has let to the Southern Bridge Co., of Birmingham, a contract to build a new foundry, 100 x 200 feet, at its plant in East Birmingham. The new foundry will not take the place of the old one, but will be used as an addition, the company's increasing business in the manufacture of engines and sugar house machinery making the enlargement necessary.

The Pittsburg Reduction Co. has received an order for all the aluminum for a new telegraph and telephone line to be erected in Manila, in the Philippine islands. The order came through Saale & Co., of Yokohama, the Japanese agents of the company. It consists of about 25 miles of telephone wire, about one-eighth inch in diameter. The line will be built through the city of Manila proper, and will connect Cavite. The Pittsburg company has made a contract with the Standard Electric Co., of San Francisco, for 150 miles of wire, weighing 200,000 pounds, to be used in carrying electrical power from water falls in the Cascade mountains to San Francisco. The wire will vary from one-eighth to one inch, the latter being used for carrying the heavier currents. The amount of the aluminum contract is $50,000. The use of aluminum for power lines is increasing. For caps for fruit jars, large shipments of sheet aluminum are being made to Muncie, Ind.

The West Virginia & Pittsburg Road is to erect new shop buildings at Weston, W. Va., at a cost of $18,000.

Work has begun at Ennis, Tex., on an enlargement of the shops and foundry of the Houston & Texas Central Road.

The plans have been made for new foundry buildings for the American Steel Foundry Co., at Granite City, Ill.

The repair shops of the Illinois Central will be removed from Freeport, Ill., to Dubuque, Ia.

The United States Radiator Co., West Newton, Pa., is building an addition, 55x105 feet.

It is reported that the Penn Electrical Mfg. Co. will remove its plant to Irwin, Pa., citizens having agreed to donate a site and $5,000 bonus.

It is reported from Chicago that the Titan Steel Co.'s plant will be located at South Chicago and not at Pullman, as originally announced. The proposed site is said to be just south of the Chicago Shipbuilding Co.'s yards.

Fires and Accidents:—

The nail plant of the F. A. Godcharles Co., at Milton, Pa., was almost destroyed by fire, Dec. 3. The loss on buildings and stock is estimated at $100,000.

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Did you know that a steam separator, which is suitable for and is satisfactory in rolling mill service, is just the separator for any kind of a steam plant?

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The Rock Island shops at Horton, Kas., were damaged by fire, with $5,000 loss, Dec. 8.

General Industrial Notes:—

Oxmoor Furnace No. 1, of the Tennessee Coal, Iron & Railroad Co., will be ready for blast early in January and the No. 2 furnace will then go out for repairs.

At Middlesborough, Ky., the Watts Steel & Iron Syndicate has closed down its plant and will make considerable improvements, including the installation of new shears, electric crane, patent equipment for handling ore and iron direct to furnaces, new soaking pits, etc. Improvements will be completed within 90 days.

The sixth annual report of the Michigan-Peninsular Car Co., Detroit, for the year ending Aug. 31, 1898, shows net earnings of $670,877. Deducting from this the interest on $2,000,000 of the 5 per cent bonds, amounting to $100,000, and 6 per cent on the preferred stock, amounting to $300,000, a surplus of $270,877 is left.

The American Steel Casting Co. has declared a dividend of 3½ per cent on its preferred stock, payable Dec. 20th.

The General Electric Co. has declared a dividend of $17.50 per share on its preferred stock, payable Dec. 22nd.

The Wm. Cramp & Sons Ship & Engine Building Co. has declared a dividend of 1¼ per cent., payable Dec. 15.

The consolidated Pneumatic Tool Co., 11 Broadway, New York, has been placed in charge of Mr. John H. Hull, as receiver, on application of Mr. Horace D. Gove, who holds a judgment for $11,198 against the company, according to report. The assets are said to consist only of the patents, which were originally valued at $50,000.

Earl C. Bacon, Havemeyer Bldg., New York, has recently shipped to Japan and China a number of winding engines for use in the coal and other mines of those contries. They were specified by the eningeers of the Chinese and Japanese imperial governments. This concern has also sent considerable machinery to Siberia within the past 30 days.

The Springfield Gas Engine Co., Springfield, O., has leased the first and second floors of a building on West Columbia street, in that city, in order to secure additional accommodations, and will increase its force of workmen as soon as the shop can be fitted up. The officers of the company are: President, R. H. Rodgers; vice-president, Chas. H. Paxton; secretary and general manager, Addison S. Rodgers.

At Reading, Pa., an execution for $31,045.83 was issued against the Leesport Iron Co., on a judgment bond given in 1886 to J. H. Sternbergh, who assigned the bond to John E. Woottan, of Philadelphia. The interest was not paid this year.

James Allen goes from Kalamazoo, Mich., to St. Joseph, Mich., to take charge of a brass and iron froundry which the Truscott Mfg. Co. will start up.

The Wheeler shipyard, at West Bay City, Mich., is to be re-opened under the management of F. W. Wheeler, early in January, it is now reported.

Improvements costing $25,000 are being made at the Greenville, Pa., rolling mill of the P. L. Kimberly Co., and it will start up early in January.

The Sioux Cofliss engine at the Omaha Exposition was awarded the gold medal. It was built by the Murray Iron Works, Co., of Burlington, and was in continuous operation, 24 hours a day, through the greater part of the exposition, furnishing all of the power used on the grounds.

The Gallipolis (O.) Foundry & Machine Co. has been incorporated with a capital of $25,000. The incorporators are: R. H. and T. E. Bradbury, C. R. Comer, F. M. Hill and Hallis C. Johnstone. It has been a partnership for 30 years, its business being largely with river steamboats.

The Torrington Co., of Torrington, Conn., formerly the Excelsior Needle Co., has given a mortgage for $1,000,000 to the New England Trust Co. An increase of capital and a change of name came a short time ago.

The Upson Nut Co. has recently completed a number of new nut machines at its Unionville, Conn., plant for shipment to its Cleveland works.

The General Electric Co., Schenectady, N. Y., has received an order from the company which is constructing the underground street road in Paris for eight electric locomotives and the apparatus that goes with them.

The Keystone Axle Co., Beaver Falls, Pa., after a series of experiments with its new process of rolling axles, now has the

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plant in successful operation, and recently made a shipment of 375 car axles. The plant is running steadily, and plans are being made for a machine shop.

Sheridan Furnace No. 2, Reading, Pa., one of the largest in the Lebanon valley, will go into blast before the new year, after two years' idleness.

The Duquesne Steel Works will close down Dec. 22 for repairs, and resume on Dec. 27.

It is reported that Harbison & Walker, Pittsburg, fire brick manufacturers, are experimenting with a new fire clay being mined by the Columbia Fire Clay Co., Pittsburg, at Washingtonville, Columbiana Co., O. It is said the clay contains a high grade of silica and is free from sulphur, and that the brick will stand a temperature of 4,000° F.

The tin house of the Falcon Tin Plate & Sheet Co., Niles, O., resumed operations Monday, after the shut-down for inventory in connection with the tin plate consolidation.

The Weimer Machine Works Co., of Lebanon, Pa., has received a contract from the Bellaire Steel Co, Bellaire, O., for eight 20-ton iron ladle cars for carrying the hot metal from furnace to pig iron casting machines. The same company has given an order for narrow gauge liquid cinder cars of the Weimer patent.

The *Railroad Gazette's* statement of car and locomotive orders includes 300 cars for the Boston & Albany, from the Union Car Co.; bids asked for 200 coal and 100 box cars for the Columbus, Sandusky & Hocking; 2,000 box cars for the Erie from the Michigan-Peninsular Car Co.; bids asked on 500 cars for the Cincinnati, New Orleans & Texas Pacific; 250 box cars for the Rio Grande Western from Missouri Car & Foundry Co., and bids asked on 300 cars; 1,000 freight cars to be ordered by the Oregon Short Line; specifications prepared for 700 freight cars for the Chicago Great Western; 350 cars for the Buffalo, Rochester & Pittsburg; 600 stock cars for the C., B. & Q., from the Illinois Car & Equipment Co., and 600 box cars from the Wells & French Co.; 200 coal cars for the St. Louis, Peoria & Northern; 100 flat cars by the Chicago & West Michigan from the Terre Haute Car & Mfg. Co.; 50 locomotives figured on by the Erie; 10 freight locomotives to be bought by the Michigan Central; plans for 5 new engines for the Pittsburg & Lake Erie; 30 locomotives for the New York Central, from the Schenectady Locomotive Works; 45 locomotives for the Lake Shore from the Brooks Locomotive Works, and a report that this number will be increased to 200 within a year; 25 locomotives for the Southern Pacific from the Cooke Locomotive & Machine Works, and 20 from the Schenectady Locomotive Works.

The Cambria Steel Co, Johnstown, Pa., for some time has been operating its by-product coke oven plants at Franklin, a suburb of Johnstown, and having a number of the by-products. It is now the intention to utilize the tar in the manufacture of roofing paper. The business of N. West & Co., Pittsburg, who have been manufacturing tar and asphalt coated roofing papers, has been absorbed, and the plant will be removed to Johnstown.

Stockholders of the Landis Tool Co., Waynesboro, Pa., have voted to issue $25,000 additional stock, making the working capital $75,000. A dividend of 5 per cent has been declared.

New machinery is being installed by Lee, Cowan & Bowen, spring manufacturers of Syracuse, and the working force will be increased. Export trade is increasing.

The Muncie Iron & Steel Co., Muncie, Ind., has given notice of an increase of $50,000 in capital stock.

The Lorain Foundry Co., Lorain, O., has taken a contract for 200 tons of castings for the Holly Mfg. Co., manufacturers of the Holly steam pump, the work being for the new Metropolitan Water Works plant, New York.

The Pennsylvania Steel Co. has given a contract to the Brown Hoisting & Conveying Machine Co., Cleveland, for the erection of a 200-foot gantry crane, at the Steelton works.

The Excelsior Furnace, at Ishpeming, Mich., has been blown out.

The Mesta Machine Co., of Pittsburg, has received an order from the Alabama Steel & Shipbuilding Co., Ensley, Ala., for tables and hydraulic manipulators, for the 44-inch blooming mill to be installed in the new plant.

The Rebecca Furnace, of the Kittanning Iron & Steel Mfg. Co., at Kittanning, Pa., has resumed operations again, after being out of blast since August.

Jas. P. Witherow, engineer, of Pittsburg, has filed a petition in bankruptcy. He claims that his liabilities among creditors whose claims are unsecured, amount to $47,890.40. He has no assets, but claims exemption on personal property.

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Bessemer Pig Iron, Steel Billets, Blooms, Black Plate, Tin Plate, Tin Plate Bars, Wire Rods, Market Wire and Wire Nails.

The plant of the Spaulding Machine Screw Co., Kensington, near Buffalo, was sold last week to satisfy a first mortgage, held by John R. Keim, of New York City. It is expected that a company will be organized to run the plant. It is valued at $100,000.

The old Whitely malleable plant at Springfield, O., now owned by I. W. Frey, will be started up this month with 100 men.

The Westinghouse Electric Co. has received an order from Hanover, Germany, for the electrical equipment of 50 street railway cars. The order embraces motors and controllers.

It is stated that an order for 15,000 tons of rails will soon be placed by the B. & O. for lines east of the Ohio. Over 70,000 tons have been laid under the receivership management.

The work of fitting up the old plant of the Beaver Valley Mfg. Co., at Bridgewater, Pa., for a rolling mill is progressing rapidly. One set of continuous rolls has already been placed in position. W. J. Whitney, of Pittsburg, is at the head of the concern, which will manufacture rods for the Union Drawn Steel Co., of Beaver Falls.

The Homestead Steel Works closed for repairs this week. The shut-down is expected to last about a week. A part of the hammer department of the 29th street mill of the Carnegie Steel Co., Ltd., has been closed down.

The Buckeye Engine Co., Salem, O., is installing a 10-ton traveling crane in the addition to its machine shop, operating it by compressed air. A five-ton crane is also to be added to the foundry equipment.

HOLIDAY EXCURSIONS.

Special Rates via Penusylvania Lines for Christmas and New Year.

Owing to Christmas and New Year falling on Sunday, and the observance of those holidays to occur on Monday as a rule, the annual custom of the Pennsylvania Lines to grant special rates will this season cover two extra days. Excursion tickets may be obtained over these lines December 23, 24, 25, 26, 30 and 31, 1898, and January 1 and 2, 1899. Tickets for adults will not be sold at less rate than 25 cents, nor for children at less than 15 cents. The return limit on tickets sold at special rates on the above dates will be Tuesday, January 3, 1899. For special information about rates, time of trains, etc., please apply to nearest Ticket Agent of the Pennsylvania Lines.

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Elyria Depot: Huron St., West Side.

South Bound.			Central Standard.	North Bound.		
15	13	11	Lorain Branch	12	14	16
P.M.	P.M.	A.M.	LV. AR.	A.M.	A M	P.M.
4:25	2:25	6:27	Lorain	9:15	11:35	7:30
4:40	2:30	6:44	Elyria.....	9:00	11:21	7:16
4:56	2:55	7:04	Grafton	8:43	11:07	6 58
5:15	3:12	7:23	Lester.....	8 25	10:50	6:40
5	3	1	Main Line	2	4	6
5:30	2:25	7:20	Cleveland ..	8:30	11:50	7:15
5:47	2:41	7:36	Brooklyn	8:14	11:34	7:01
6:42	3:26	8:22	Lester.....	7:29	10:49	6:19
6:52	3:35	8:30	Medina.....	7:16	10:37	6:07
7:05	3:46	8:41	Chippewa La	7:04	10:26	5:55
7:20	4:01	8:56	Sterling.....	6:48	10:12	5:40
8:09	4:46	9:45	Massillon	6:00	9:23	4:54
8:55	5:31	10:34	Canal Dov-r.	5:11	8:36	4:10
9:02	5:38	10:41	New Philade	5:04	8:28	4:03
9:20	6:05	11:25	Uhrichsville	4:45	8:10	3:45
.....	8:10	1:30	Bridgeport	.....	6:05	1:40
.....	8:25	.....	Bellaire.....	.....	5:50	.....
P.M.	P.M.	P.M.	AR. LV.	A.M.	A.M.	P.M.

No. 9 leaves Lorain 9:50 a.m., Elyria 10:05, Grafton 10:21; arrives Lester Junction 10:40. No. 10 leaves Lester Junction 3:25 p.m., Grafton 3:42, Elyria 3:57; arrive Lorain at 4:10 p.m.

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